THE IRON AGE

New York, Thursday, June 28, 1906.

Flexible Tubing.

The Esco Tubing Made from a Continuous Metal Strip.

With respect to method of manufacturing there are two classes of flexible tubing, that made of two wires and that made of metal tape or strips. In the first a coil of spring wire is wound about a mandrel, the turns being laid as closely together as possible; this forms the inner part of the tube. The outside layer is composed of a second wire wound in the groove between adjacent turns of the first, the whole forming a tube highly flexible and tight against liquid or gas under moderate pressures. In this process the outside wire is wound under considerable strain to slightly separate the coils of the inside wire and place them under sufficient tension to insure the continuous contact of the individual wires along their entire length. Evidently such a tube demands wire that is free from surface imperfections, since the slightest inequality would destroy the necessary metallic contact.

In the second method of making flexible tube a metal strip is passed through guides and rollers and formed so that when wound upon a mandrel a lock joint is produced between each turn of the finished tube. The thickness or gauge of the strip is determined by the strength required of the tube; the width of the strip by the size and flexibility desired of the tube. The width must be sufficient to allow for the turned down portions that lock the coils.

Both methods turn out a tube that is flexible in the highest degree, but in order that the second may stand pressure a packing is introduced between the coils. This is not essential in the first, as the contact between the two wire layers is maintained by the elasticity of the metal and is sufficient to insure a tight joint throughout.

To the second class belongs the tubing made by the Esco Mfg. Company, 750 East 134th street, New York, which is largely used on automobiles to connect the pressure bulb and horn, and is the invention of S. Salvini, the manager of the works. This tubing is made in sizes from ¼ to 2 inch inside diameter. Although primarily intended for carrying comparatively light pressures, it is, by proper packing, made applicable to high pressure work in all sizes. It is made of brass, copper, steel or other metal, as may best fit the conditions of service.

While the tube is interesting as a new product, the coiling machine that makes it is more so. The most striking and important feature of the machine is its simplicity, having few parts, and these at all times in plain view for inspection or adjustment. The tool consists of a head and tail stock mounted upon a bed similar to that of a lathe. The drive is all from the head stock end. The belt from the countershaft leads to a pulley on a shaft supported in a bearing between the legs at the head stock end, Fig. 1. On this shaft is a sprocket connected by chain to a second sprocket on a shaft which corresponds to the live spindle of a lathe, except that it extends the full length of the bed. It is splined and through a feather drives the tail stock, the only feeding movement of which is in a direction away from the head and equal in rate to the making of the tube; in other words, the tail stock recedes as the tube is formed. On the splined shaft, near the driving sprocket, is another connected by chain with a sprocket on a shaft at the end of the bed, from which the lower of the two rolls, B, Fig. 2, is driven, the rolls being connected by spur gearing.

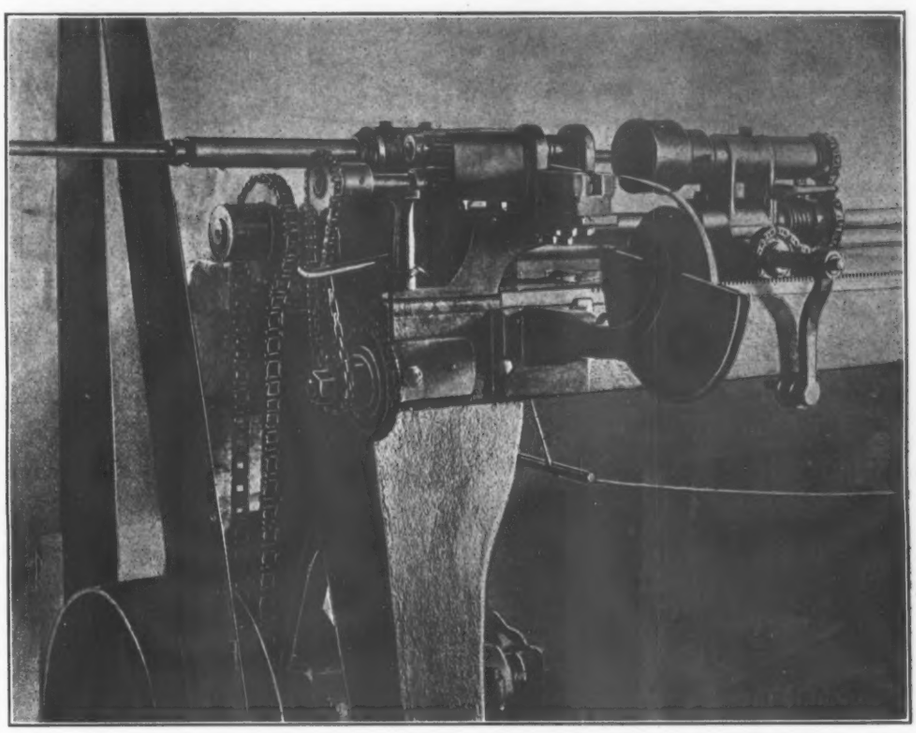


Fig. 1.—Driving End of the Machine Used in Making the Esco Flexible Tubing.

In all sizes of tubing it is not necessary to have a positive drive between the head and tail stock to provide for the feed of the tube; as the blank is coiled about the mandrel it will force the tail stock back and do away with the need of any feeding device.

The tail stock is driven by the splined shaft extending through its base. A worm, feathered to this shaft, is free to slide along it, and engages a worm wheel that drives, through sprockets and chain, a gear engaging with a rack placed along the front of the bed. This

gear is not shown in Fig. 1, as it was not necessary for the particular size of tube that was being made when the photograph was taken. The rear end of the worm carries a sprocket that drives the spindle of the chuck in which the mandrel is grasped.

It will be seen that there is a positive relation between the movements of the rolls that feed the wire to the mandrel and the chuck that moves the completed tube away. The ratio of the gears and sprockets is so proportioned that the rolls feed the strip only as fast as it can be taken care of by the movement of the mandrel, and the latter when positively withdrawn axially cannot move so fast as to pull the coils apart.

Referring to Fig. 2, the strip C is fed to the rolls B from the coil A, and is squeezed by them into an S-shaped cross section, as shown in Fig. 3. It then enters the guide E, that carries it to the mandrel A. The passage in the guide E is made to conform to the new shape of the strip, and the outer end of the guide is curved to fit closely to the mandrel. The upper part of the guide E is shown removed, and placed in an inverted position on top of the head stock in Fig 2.

An important point that should be noticed is that the strip enters the guide at an angle which is determined by the pitch of the coils of the tube. This insures the meeting of the tape and the mandrel at the proper angle. If the guides were shifted there would be either a tendency for the strip to ride up on the coil that had been last finished or for the coils to separate.

The guide E also serves as a guide for the asbestos packing cord that passes up through the bottom of the bed. This cord enters with the tape under the right hand inverted portion of the S, and is inclosed between it and the left hand portion of the S of the last coil of the tube.

On the opposite side of the mandrel is what may be called a compression piece, F, having a concave end in proximity to the mandrel, which is formed with slight projections, spaced to coincide with the grooves of the tube as it is formed. This piece acts both as a spacer between the threads of the tube and to complete the turning over of the edge of the strip that incloses the cord. A detail section of one wall, and a photograph of a finished tube, bent to indicate its flexibility, are shown in Fig. 3.

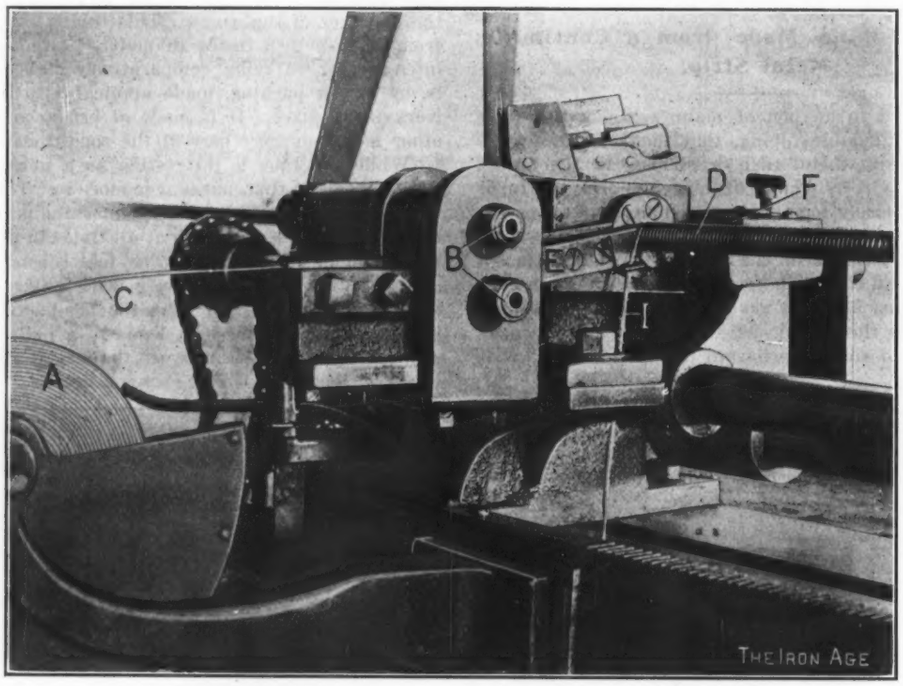


Fig. 2.—A Near View of the Head Stock, Showing the Guide Cover Removed.

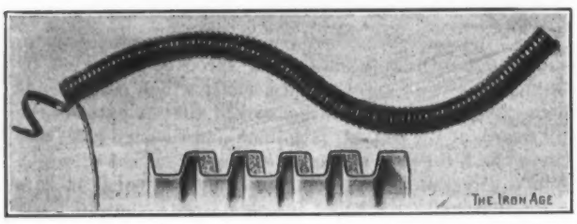


Fig. 3.—The Finished Tubing and a Detail Longitudinal Section.

Municipal Ownership of Chicago Street Railroads.

Rapid strides are now being made toward the early solution of the Chicago traction question. The relegation of the archaic cable lines to the scrap pile is contemplated within the very near future, inasmuch as authority for their electrification has been given the companies by the city officials. Pursuant to the demands of the municipal ownership faction, the traction companies have given the Council Committee on Local Transportation the figures at which they would agree to sell to the city their present tangible properties. The price placed on the holdings of the Chicago City Railway Company and Union Traction Company reaches a total of $47,505,153. This has been arrived at by determining the cost at present prices of reproducing the properties in question and deducting therefrom the amount of money that would be required to place the property in practically new condition. No estimate has been made of the values of the franchises, which, according to the United States Supreme Court, have, with few exceptions, been invalidated. As authority has been given for the issuance of bonds aggregating only $75,000,000, it is evident that no amicable adjustment of values can be arrived at on the present basis, as it is estimated that the cost of necessary improvements is close to $25,000,000, thus leaving very little capital in reserve necessary for operation.

The State Railroad Commission of Kentucky has ordered a reduction of 25 per cent. in freight rates. The matter had been under investigation for six months. The opinion of the commission sustains the contention of shippers in all sections of the State that they have been discriminated against and that the entire State has suffered.

The Relative Corrosion of Wrought Iron and Steel.*

BY HENRY M. HOWE.

On one hand, we have the very general public opinion that steel corrodes not only faster but very much faster than wrought iron, an opinion held so widely and so strongly that it cannot be ignored. Smoke does not prove that fire exists; but such strong smoke bids us look carefully for fire. On the other hand, we have the results of direct experiments by a great many observers in different countries and under widely differing conditions, and these results certainly tend to show that this popular belief is completely wrong and that, on the whole, there is no very great difference between the corrosion of steel and wrought iron. Under certain sets of conditions steel seems to rust a little faster than wrought iron, and under others wrought iron seems to rust a little faster than steel. Thus, taking the tests in unconfined sea water as a whole, wrought iron does constantly a little better than steel, and its advantage seems to be still greater in the case of boiling sea water. In the few tests in alkaline water wrought iron seems to have the advantage over steel; whereas in acidulated water steel seems to rust more slowly than wrought iron.

As technical and scientific men we naturally attach greater weight to the numerical results of careful direct comparative tests than to rumor and popular belief. When ultra conservative engineers used to cry out against steel boilers, it seemed to us like the old cry: "Great is Diana of the Ephesians." Those who raised it cried what they firmly believed was true, and what they thought every sensible man knew to be true. But they were wrong; and I need not tell this society that such cries and popular beliefs, even when widely and firmly held, often prove wrong. Compared with the results of direct comparative tests such beliefs have the great disadvantage of lacking all precise and definite foundation; they are easily spread from man to man.

Modern Conditions Increase Corrosion.

The fact that steel has come into wide use simultaneously with a great increase in the sulphurous acid in our city air and of strong electric currents in our city ground may well lead the practical man, be he hasty or cautious, into inferring that the rapid corrosion of to-day is certainly due to the new material of to-day, steel, whereas, in fact, it may be wholly due to the new conditions of to-day, sulphurous acid and electrolysis. At the same time, while popular belief has the disadvantage of lacking direct numerical comparative data, it has the very great advantage of being based on the actual conditions of use more closely and often far more closely than our direct comparative tests are, unless these are planned with very great care.

In view of this great discrepancy between popular belief and the results of our direct tests it behooves us who have relied chiefly on these latter to examine their conditions carefully to see whether they really have represented fairly the conditions of actual industrial use and service in such a way that if there is a real difference between the corrosion of steel and that of wrought iron such a difference would become manifest. In short, have our direct comparative tests been trustworthy?

Differences Between Iron and Steel.

There are three prominent differences between iron and steel which ought to cause a difference in their rapidity of rusting: First, blow holes; second, manganese, and third, the presence of cementite in the steel and of cinder in the wrought iron. Let us take these up in order and see how they require that direct tests should be very prolonged or pushed to destruction:

1. Blow holes exist in steel, but not in wrought iron. But blow holes, at least blow holes which do not weld up and thus cease to exist, are not necessary. Yet they are to be prevented only by care and skill. Hence, get your steel only from careful and trustworthy makers.

2. Manganese steel always and almost necessarily contains more manganese than wrought iron. This may or may not hasten its rusting. If it does, then its effects ought to be made manifest even in short time tests. From the fact that such tests do not show that steel rusts materially faster than wrought iron I infer that this manganese is probably not a serious cause of rusting.

3. Steel is generally richer than wrought iron in cementite, the iron carbide. Wrought iron always contains very much more cinder than does steel. Each of these substances, the cementite of the steel and the cinder of the wrought iron, may have a double influence on corrosion, hastening it through difference of potential and retarding it by acting as a mechanical barrier like so much paint, to exclude the oxygen or the air or the water. It is not clear that the influence of difference of potential ought to change materially as corrosion proceeds, but it is clear that mechanical protection given by the plates of cementite and of cinder ought to increase as corrosion proceeds. When a piece of wrought iron, for instance, is first exposed to corrosion, only the outcrops, so to speak, of the sheets of cinder come to the surface. Its mechanical protection is very small. But as corrosion proceeds, and more and more of the metal which at first overlay the sheets of cinder is eaten away, the remaining cinder forms a larger and larger proportion of the outer surface, and therefore protects a constantly increasing proportion of the underlying metal from corrosion. In short, the mechanical protection afforded by the cinder ought to increase as corrosion proceeds.

Here, then, is a cause which, as corrosion proceeds, should continuously tend to retard the corrosion of wrought iron, and to make it compare more and more favorably with steel. But, in like manner, as steel is gradually corroded away, more and more of its surface should come to be composed of cementite, and this fact should tend to retard the corrosion of steel, because cementite, too, should protect the underlying free iron or ferrite.

Early and Later Corrosion.

These causes may in time reverse the initial relative rapidity of rusting of steel and wrought iron. Steel, which in the first few months may rust faster than wrought iron may, on greatly prolonging the experiments or pushing them to destruction, actually rust more slowly, and *vice versa*.

Now, of the two the cinder of wrought iron ought to gain more than the cementite of the steel in its value as a mechanical retarder of corrosion as time goes on and more and more of the metal is eaten away. The reason for this is that the cementite is in such extremely minute miscroscopic plates that the eating away of a very small quantity of the iron from above them ought to bring very nearly the full proportion of this cementite to the surface; whereas, the much larger and more distantly scattered plates of cinder in wrought iron would not constitute their full share of the surface until a much thicker layer of initially overlying metal had been eaten away. This, then, may be the true explanation—that is, the reason why steel does not rust faster than wrought iron in our direct tests, though it does in actual use—that our direct tests are too short to bring out the full protective action of the cinder of the wrought iron. Or the reverse may be true. As time goes on the harmful effect of the difference of potential of the cinder may grow more than its protective action. Let us therefore henceforth push our tests to destruction.

Two other points: Sheet steel roofing may rust faster than iron because the latter holds the paint better, and yet steel in other forms, like tubing, may rust no faster than wrought iron. Again let me emphasize the difference between different steels. Carelessly made steel containing blow holes may rust faster than wrought iron, yet carefully made steel free from blow holes may rust more slowly. Recognize that any difference between the two may be due not to the inherent and intrinsic nature of the material, but to defects to which it is subject if carelessly made. Care in manufacture and special steps to lessen the tendency to rust might well make steel less corrodible than wrought iron, even if steel carelessly made should really prove more corrodible than wrought iron.

* A contribution to the discussion on the "Corrosion of Iron and Steel" at the meeting of the American Society for Testing Materials at Atlantic City, June 22, 1906.

Making Nuts and Rings Without Waste.

Methods of making wrought nuts, washers and rings without waste of metal have been based on three different principles. The first and most commonly applied involves the bending of a section of rod or bar into an annulus and then welding the abutting or lapping ends together and forging to final shape.

Fig. 1 illustrates a method involving the first principle applied to the manufacture of hexagonal nuts. In carrying out this method a heated straight blank of suitable cross section and length and having its ends scarfed is placed across the opening between the two separated sections of a die composed of separable parts and is then forced transversely between the matrix portions of the dies by a plunger engaging its middle. Thus the blank is bent into U form and comes to rest opposite the two semihexagonal cavities of the dies. A mandrel is then inserted in the bend of the U-shaped blank in the axis of the die and the two die sections are brought laterally together, thus bending the blank so as to bring its ends together and also partially welding it and forging it into hexagonal form. With the blank still held between the two die sections, a forging plunger, through the center of which the mandrel passes, is forced against the face of the blank, which is thus thoroughly welded and forged to final shape. The only remaining step is to retract the dies and strip the finished nut blank from the mandrel.

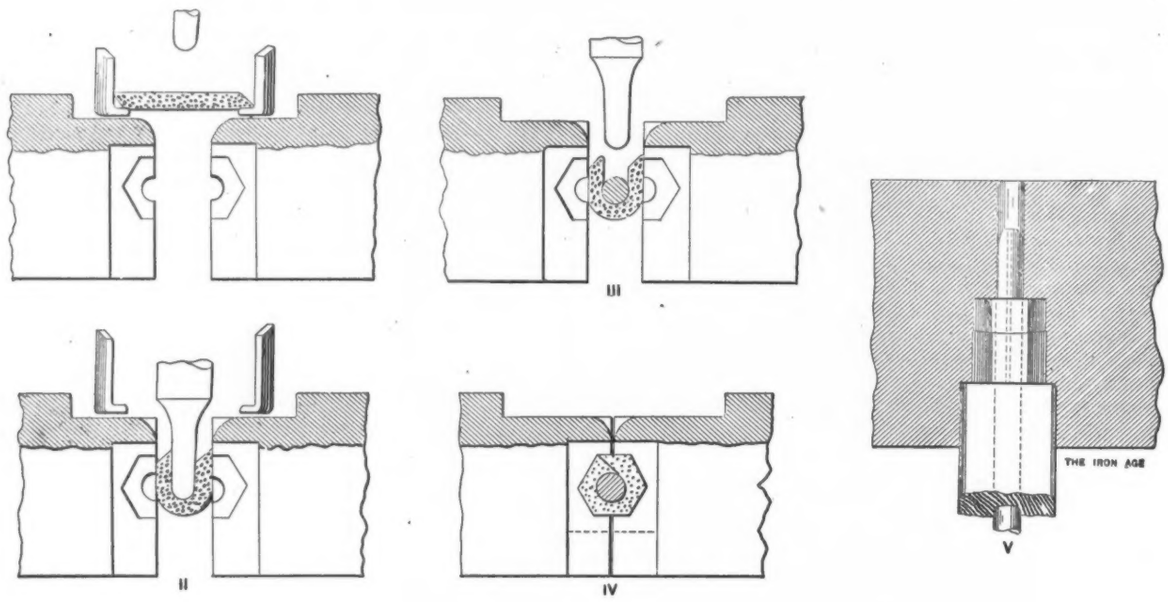


Fig. 1.—A Method of Making Nuts by Bending a Piece of Bar Stock Around a Mandrel.

An economical mode of making washers on the same principle, Fig. 2, consists in feeding round wire rod across a mandrel, cutting a section from the rod, then bending the section into ring form around the mandrel, placing the ring thus formed in a die cavity of a diameter equal to the exterior diameter of the washer desired, then inserting a smaller mandrel into the central opening and flattening the ring around the smaller mandrel or core into the annular seat, thus causing the metal to completely fill the space between the wall of the die and the sizing mandrel. If the metal be hot, the ring may be welded and forged into a continuous mass; if cold, the joint will be so tight as to be invisible. In practice the matrix die is perforated centrally, and through it is inserted the bending mandrel. On the end of the bending mandrel is formed a smaller projection adapted to serve as the sizing core. In operation the bending mandrel is extended through and beyond the die cavity, so that the wire rod may be fed across it and the cut section thereof bent around it; the mandrel is then withdrawn until the shoulder formed at the junction of the larger and smaller parts is flush with the bottom of the die cavity, the smaller core projecting into the cavity. By the act of withdrawing the ring is stripped from the larger portion, when it strikes the bottom of the die and is left resting within the die and surrounding the core. The forging plunger is then advanced and the ring flattened into a washer. The flowage of the metal is toward the center, thus tending to compact it, whereas enlargement of the diameter in the act of compressing would have a tendency to stretch and weaken the exterior portion. By substituting cores of different sizes washers with different sizes of openings may be formed.

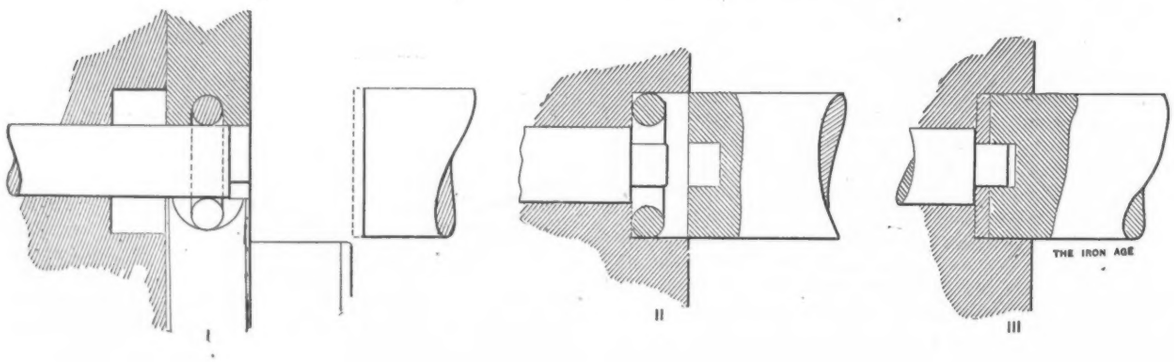


Fig. 2.—A Method of Making Washers Similar in Principle to That of Fig. 1.

A second principle adopted in forming nuts without waste involves side forging and shearing blanks from a bar of metal having a thickness equal to the desired thickness of the nuts. The central hole is formed by driv-

ing a punch or projection thereinto and expanding the metal of the bar laterally in a die.

One of the earliest methods involving this principle is illustrated in Fig. 3. By the method here shown a bar is passed between die rolls having mating male and female dies alternately arranged. A tubular plunger surrounding a tubular punch forms the bottom of each female die, and a stationary cam is so arranged as to force the punch outward to perforate and expand the blank when any particular pair of dies come into line between the axes of the rolls. A second cam is arranged to force the tubular plunger outward at the proper time to discharge the blank. As the end of the bar enters between the rolls a blank is cut from the bar and pressed into the die cavity on one roll, and as the rolls rotate the cut off blank is compressed and perforated, while the next blank in the rear is cut off and forced into the die cavity of the opposite roll. The blanks are continuously discharged from the alternate cavities in the opposed rolls.

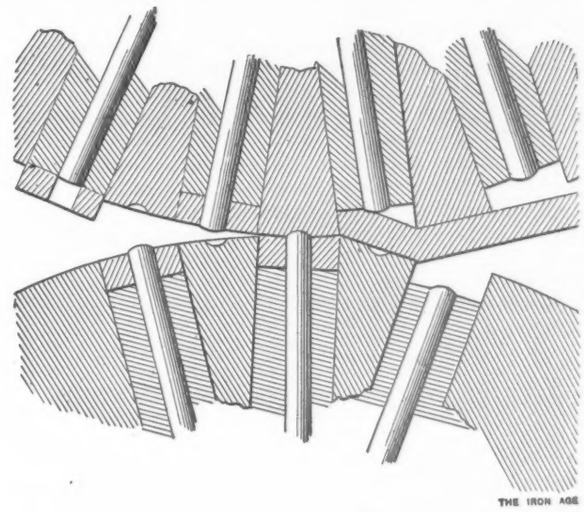


Fig. 3.—Punching Nuts from Blanks Sheared from a Flat Bar.

Another commonly proposed method involving the second principle consists in rolling a bar between rolls having a groove of a shape to form the sides of the nut blanks and projections or punches arranged centrally of the groove, properly spaced for the purpose of partially perforating the bar at intervals on opposite sides, where the central holes of the nuts are to come. The advancing bar is then brought under a press whose plunger is timed to punch the center hole completely and cut off the blanks.

By the third principle the bar of stock is operated on endwise. For example, nuts may be made from bar stock by shearing a section of sufficient thickness to form a nut blank, then inclosing this section in a die a little larger than the blank and driving an expanding punch through it, causing the blank to expand and fill the die. Fig. 4 shows a round rod sheared into round blanks and the blanks centered successively in a hexagonal die, of such size that the circumference of the blank touches each of the die faces; this leaves space about equal to the volume of metal displaced by the punch—a method adopted in later years for piercing tubular billets for use in rolling seamless tubes. Some have thought it preferable, however, to roll the original bar of a section similar to that of the nut blank to be formed, but smaller, and then expand the blanks by punching, upon the theory that the metal would thus be subjected to less strain.

Fig. 5 illustrates a mode of utilizing every scrap of steel or iron in making nuts on the last mentioned principle. This method was patented in 1888. The material used is a rod having a diameter equal to that of the hole desired in the nut. The rod is clamped between a pair of dies with one end projecting a distance sufficient to provide metal equal in mass to that of the unpunched blank. A heading die having a forming cavity therein, and containing centrally thereof a slidable punch, whose end is flush with the bottom of the die cavity, is then advanced and the end of the rod thereby upset into the shape of a hexagonal nut blank. The punch, which is of the exact shape and size of the rod of stock, is then advanced, the clamps slightly loosened, and the center of the upset head punched out, this punched out piece carrying the rod back with it and forming the extremity of the rod, which is still of the original shape and size, except shorter than before. The operation is repeated until the rod is used.

A similar method, designed primarily for forming large rings, is shown in Fig. 6. Here a cylindrical bloom is placed within a die fitting closely around it, except at the end, where a cavity is provided for the spreading of the metal, the end of the bloom projecting beyond the cavity. By the use of a succession of suitable tools the metal is spread and upset until the die cavity is completely filled. A punch of the exact size of the original bloom is then used to punch out the center of the enlarged head thus formed, leaving the ring in the die and driving back the bloom, which is again treated in the same manner until used up.

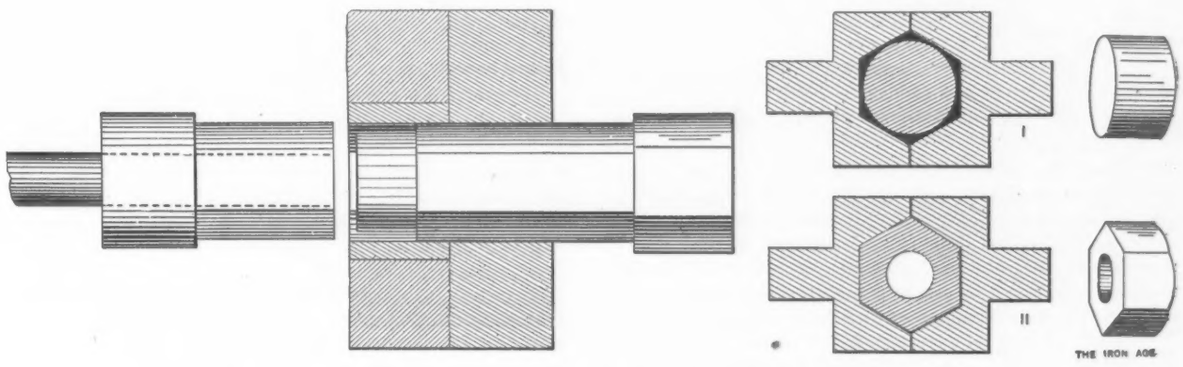


Fig. 4.—Forging and Punching Nuts from Blanks Sheared from a Round Bar.

For making small metal washers the method may be practiced very simply, by upsetting one end of a rod between flat ended dies, and the rod punched back through the center of the upset head, as illustrated in Fig. 7.

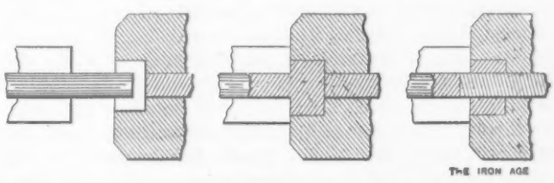


Fig. 5.—An Upsetting and Punching Method, Using Bar Stock the Diameter of the Bore of the Nut.

The method shown in Fig. 8 avoids the necessity of driving back the entire stock rod, when punching the center to form the nut or washer. The rod is grasped near the end and the end upset by a plunger having a

cavity of proper size and shape. The rod is then moved forward endwise and an annular cutter forced over the end, thus stripping the washer backward over the rod. In the illustration, the plunger *a* upsets the blank, then moves to one side, and the stripper *b* moves over and drives the washer back. The spring pawl hooks *c* snap over the edges of the washer as the stripper moves forward and hold it between them and the plunger, thus stripping the washer backward over the rod on the advance stroke, and pulling it off over the end of the rod on the return stroke.

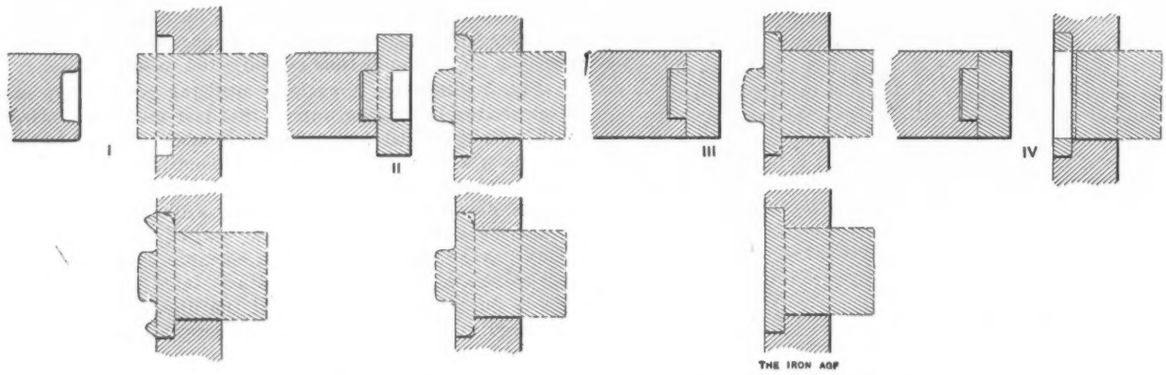


Fig. 6.—A Method of Upsetting and Punching for Making Large Rings from Bar Stock.

One of the latest inventions involving this principle comes from Germany, and the method is illustrated in Fig. 9. In the practice of this invention a rod is grooved circumferentially at intervals, dependent on the thickness of the nut to be produced, thereby forming a series of blanks connected by necks of metal, which must not be thicker than the diameter of the hole to be punched in the blank. These blanks are fed in between movable dies, *a* and *b*, which are provided with a shaping matrix, *c*, and with a holding cavity or matrix, *d*. At the beginning of the operation on a series of connected blanks the first blank will be fed into the shaping matrix, the dies *a* and *b* closed, and the punch moved down so as to project into the first blank, displacing the metal laterally. The punch is then withdrawn, the dies opened and the series of blanks fed forward, the partially shaped blank moving into position outside of the dies *a* and *b*. The latter are now closed, a preliminary blank, *e*, being inclosed in the matrix *c*, and another blank, *f*, in the gripping or supporting cavity *d*. The retaining box *g*, movable toward and from the dies *a* and *b*, is moved in, inclosing the partially formed blank. The pressing plunger *h* and the punch *i* are next moved in, the former bearing against the partially formed blank and the punch entering the same. The inward movement of the punch is continued through the retaining matrix formed by the box *g* and sides of the die blocks *a* and *b* into the shaping matrix *c*, thereby forcing into the next blank a portion of the metal from the blank *e* in the retaining matrix and from the neck *j* connecting the first and second blanks *e* and *f* held in the shaping matrix, thereby causing the lateral enlargement of this blank in the shaping matrix. The first blank of a series will be incomplete, no metal having been forced thereinto to produce the necessary lateral enlargement. On the completion of the inward movement of the punch the latter is withdrawn, together with the plunger and retaining box, *g*. As the neck *j*, connecting the adjacent blanks, is made of a diameter not greater and preferably equal to the diameter of the hole to be formed in the blanks, and consequently that of the punch also, the movement of the punch through the opening between the retaining and shaping matrices will remove such neck, and consequently leave the blank *e* in the retaining matrix wholly detached.

After the withdrawal of the retaining box, punch and the plunger, the first blank *e* is removed, the dies opened, and the series of blanks fed forward, thereby bringing the blank *f* complete, as regards external dimensions, into position on top of the dies *a* and *b*, as shown in the illustration. The dies *a* and *b* are now closed, the blank *f* being in position on top of the dies *a* and *b*, preliminary

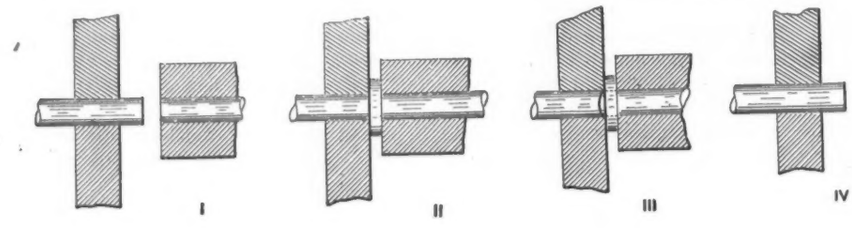


Fig. 7.—An Upsetting Method for Making Small Washers.

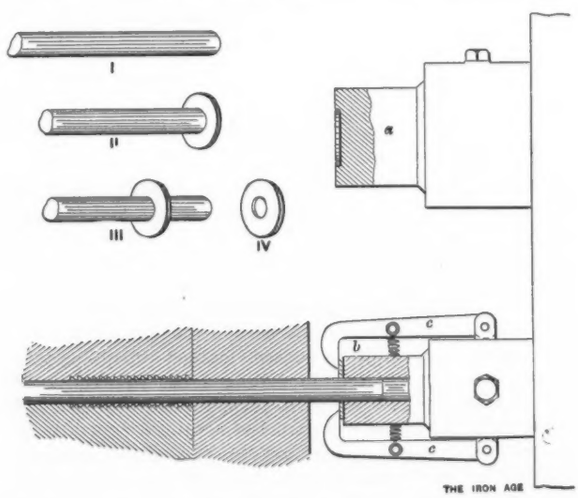


Fig. 8.—A Method Similar to Fig. 7 Which Does Away with a Punch, the Washer Being Stripped Backward Over the Rod.

blanks being inclosed in the matrix *c* and retaining cavity *d*. The retaining box is next brought into position around the blank *f*, the plunger and punch forced downward, the former compressing the nut vertically and completing its external shape. The punch, during the operation of the compressing plunger, has entered cavity *k*, formed in the previous operation. The punch continues

its movements inward, forcing the metal out of the central portion of the blank *f* and the metal of the neck connecting such blank with the next adjacent preliminary blank down into the shaping matrix, thereby enlarging the preliminary blank laterally and completely filling the matrix.

The Pennsylvania Steel Company's New Open Hearth Plant.

The new open hearth steel plant of the Pennsylvania Steel Company, at Steelton, Pa., will contain five stationary open hearth furnaces, each furnace having a rated capacity of 75 tons per heat. The hearth dimensions are: Length, 40 feet; width, 15 feet, each in the clear. The furnace building has a total span, out to out of columns, of 172 feet 5 inches. The length from center to center of end columns is 448 feet.

The charging floor will be placed at an elevation of 18 feet 6 inches above the general level, which will also be the casting floor level. The casting floor will be covered by two 65-foot span 115-ton ladle cranes, each fitted with a 25-ton auxiliary trolley. Steel will be cast on narrow gauge ingot mold buggies. The charging floor will be covered by two 75-foot span 50-ton ladle cranes, each fitted with a 10-ton auxiliary hoist. Two low type floor charging machines, capable of handling 8-foot charging boxes of the Wellman type, will be installed. Provision for a hot metal mixer, to be installed later if desired, is being made.

The stock track is arranged to permit hot metal from the blast furnaces to be poured directly into the open hearth furnaces without the necessity of passing it through a mixer or lifting hot metal ladles from the cars. Parallel with the charging floor and at the same level will be a stock yard, containing two standard and three narrow gauge tracks, all covered by two 10-ton electric traveling cranes, for unloading and handling stock. The stock yard and charging floor will be reached by an inclined approach, with both standard and narrow gauge tracks. A part of this approach will be on a trestle, on which ore, limestone, &c., may be unloaded from dump bottom cars into bins under the tracks. The materials from these bins may be loaded into charging boxes on tracks alongside which connect with the approach to the charging floor.

Gas will be furnished by Hughes mechanically stoked gas producers in a producer building paralleling the stock yard. The producers will be set so that each furnace will be served by a separate group of producers, the blast for each group being under the control of the melter. Coal will reach the producer house over the approach mentioned above. It may be dumped from drop bottom cars into bins, the bottom of which will be at the level of the tops of the producers. A traveling crane with a grab bucket will lift the coal either directly from the cars or from the bins beneath and deposit it into a crusher traveling over a set of bunkers located over the producers. Chutes will lead the coal from the bunkers into the producer hoppers. Coal may also be shoveled from the bins under the cars into the producer hoppers if the crane should get out of order. Cars on an ash track below the level of the cleaning floor will take the ashes from the producers. A calcining plant with crusher and mechanical devices for handling the stone will furnish burned dolomite for the operation of the furnaces.

Ventilating the Gallitzin Tunnel.

After the Pennsylvania Railroad's Gallitzin Tunnel was completed it was found that the smoke and gases discharged by locomotives so seriously vitiated the atmosphere that the trainmen sometimes became unconscious. Relief was provided by constructing at the east end a ventilating apparatus consisting of a sheet iron hood about 50 feet long, inclosing one track and having an inner surface coincident with the soffit of the tunnel arch and walls. The outer surface converged from the outer end of the hood to the portal of the tunnel, so as to give it a wedge shaped cross section. A Sturtevant blower was installed at the end of the hood on each side and delivered air through it to the tunnel portal, where a narrow opening in the inner surface of the hood permitted the blast to be forced into the tunnel nearly parallel with its axis.

There is a separate tube or tunnel for each track, and trains pass through them in one direction only. In the tunnel in which the apparatus has been installed the grade is up, and the trains are usually drawn by two locomotives in front and one pusher behind. As soon as the forward locomotive enters the tunnel the fan is started. The large volume of air which is forced into the narrow space between the train and the tunnel lining drives the smoke and gas in advance of the locomotive, so that its driver can keep the cab windows open and is supplied with an abundance of fresh air. The second locomotive does not work in the tunnel, and the smoke from the pusher never reaches the front of the train. This arrangement is considered efficient and satisfactory. The tunnel was designed and constructed under the direction of the engineering department of the Pennsylvania Railroad. C. S. Churchill was the patentee of the ventilating apparatus.

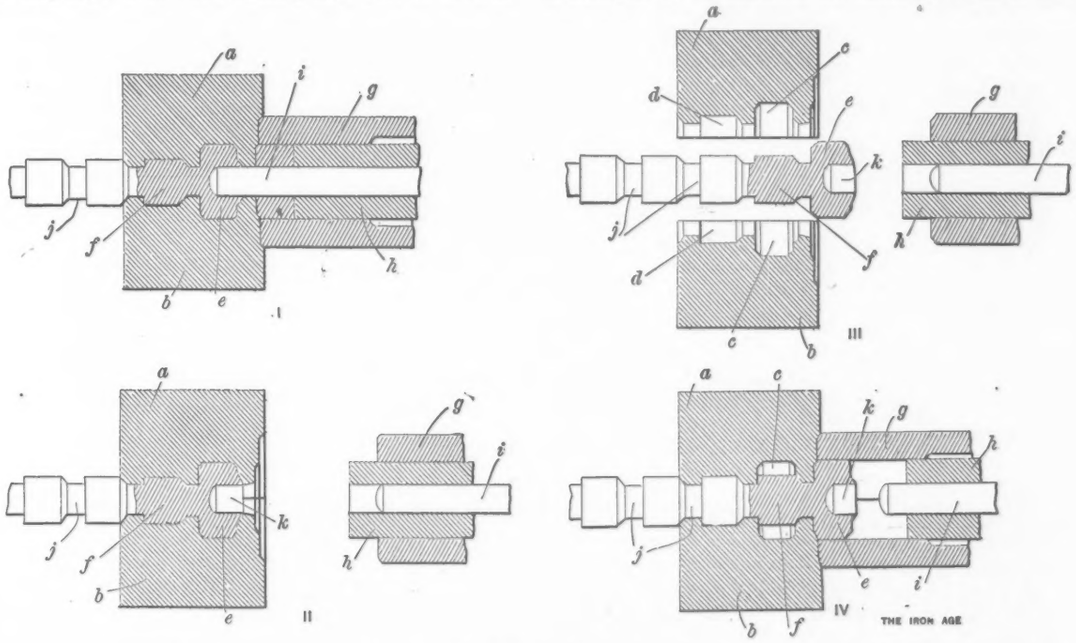


Fig. 9.—A German Upsetting Method, Using Circumferentially Grooved Stock.

The Allis-Chalmers Company's Electrical Works.

The electrical works of the Allis-Chalmers Company are located at Norwood, a suburb of Cincinnati, Ohio, and comprise the original plant of the Bullock Electric Mfg. Company, with extensive additions, which have been and are being made. The electrical apparatus built here includes direct current dynamos and motors, alternating current generators, induction motors, transformers, rotary converters, railway motors, controllers, switchboards and a great variety of auxiliary apparatus. The site is approximately 16 acres in area and is situated in close proximity to the tracks of the Baltimore & Ohio Southwestern and Cincinnati, Lebanon & Northern Railroads, as indicated in Fig. 1, which shows the general plan of the works. All of the main buildings are of modern iron, steel and brick or concrete construction, exceedingly well lighted and ventilated. The buildings are faced with buff colored pressed brick, and are of pleasing architectural effect. As shown in Fig 1, all

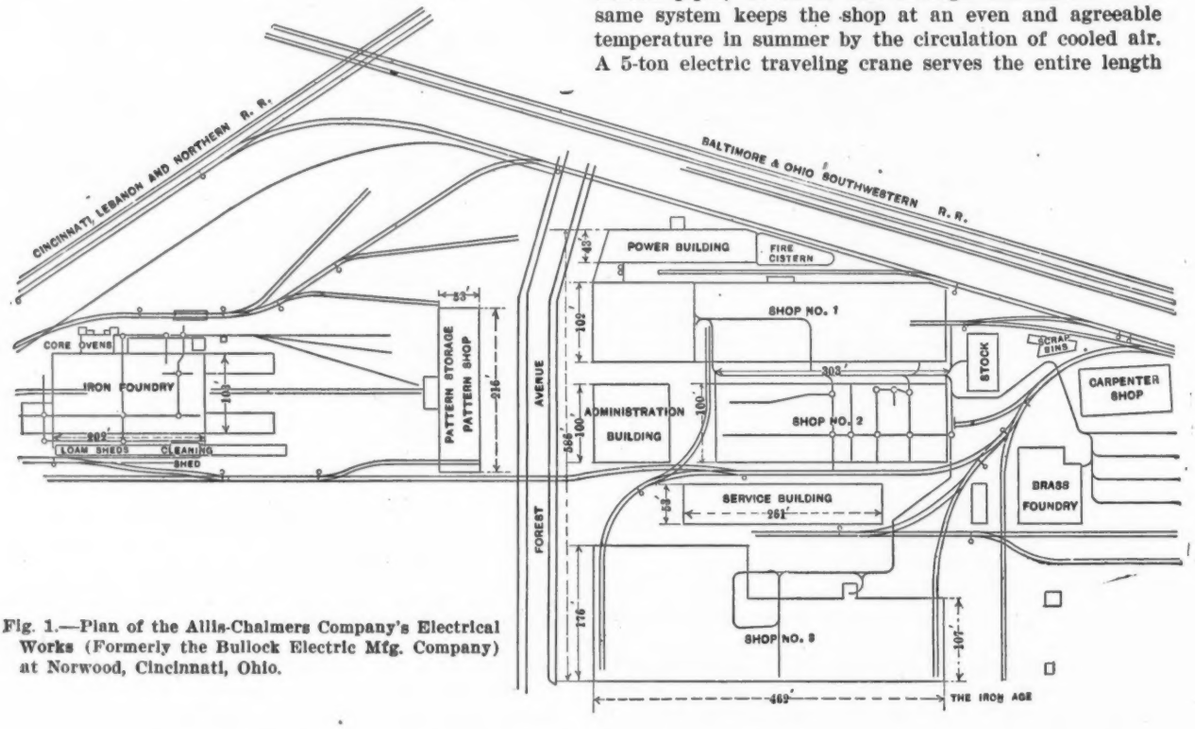


Fig. 1.—Plan of the Allis-Chalmers Company's Electrical Works (Formerly the Bullock Electric Mfg. Company) at Norwood, Cincinnati, Ohio.

buildings with the exception of the foundry face on Forest avenue.

The foundry, an interior view in which is shown in Fig. 2, is 202 feet long by 103 feet wide. The structure is so arranged that it may be readily extended in the rear toward the pattern storage building if a larger capacity is at any time required. The foundry is equipped with two cupolas, each having a capacity of 12 tons per hour. The main bay of the foundry is served by two electric traveling cranes of 25 and 15 tons' capacity, respectively. Each of the side bays is served by a smaller 5-ton crane. Coke heated core ovens are employed for the treatment of cores and molds.

The second building, opposite the main buildings and facing them, is the pattern shop and pattern storage. This building, which is 53 x 216 feet in area and four stories high, was described in *The Iron Age* November 16, 1906, and needs no further description at this time.

Machine shop No. 1, of the main group, opposite the pattern building, one of the original Bullock buildings, is 102 x 462 feet. The equipment comprises motor driven machine tools of all kinds used in the manufacture of electrical apparatus. The building is identical in appearance and construction with the others of the group. The central bay is served by two cranes of 20 and 30 tons capacity respectively, and the side bays each by a 5-ton crane. In addition to the machine tool work performed in shop No. 1, a portion of the armature winding for large machines is carried on here, and a testing department for the smaller machines has been provided in the front part of the building. The Allis-Chalmers motors, used to drive the machine tools, are operated on the Ward Leonard multiple voltage system of variable speed control. By means of this system a speed ratio of 6 to 1 is obtained, giving 12 speeds in the forward direction and nine in the reverse. In each machine shop a separate balancer is installed for dividing the main line pressure into the various subvoltages, and which may be used independently in case of the failure of those installed in either of the other shops. The connections of these balancers are such that one set may be made to carry the load of the others.

Machine shop No. 2 is identical in general appearance with the other buildings of the group. It is 100 x 303 feet, and two stories high. The roof has a wide skylight area, which secures a flood of diffused light to the top floor of the building. This unit, like the others of the group, is heated by an overhead blower system, which draws in fresh air, and having passed it around steam heated pipes, blows it out through the ducts. This same system keeps the shop at an even and agreeable temperature in summer by the circulation of cooled air. A 5-ton electric traveling crane serves the entire length of the shop. An industrial railroad connects the punch and the annealing departments. At both ends of the shop freight elevators, driven by electric motors, connect the upper and lower floors. The drying ovens are also connected directly with the insulating department by a smaller elevator.

On the first floor is located the punching department, where the sheet steel punchings for armatures and field poles are made; this shop is provided with a complete equipment of motor driven punch presses. On this floor the armature cores for direct current dynamos and motors and the stator cores for small alternating current machines are assembled. The commutator department is located at the rear, and in a room separated from the rest of the building by fireproof walls the punchings for armature and stator cores are annealed and japanned. The annealing equipment consists of two ovens arranged for oil fuel; each oven with a capacity of about 30,000 pounds of steel at each charging. These ovens are of the latest design, provided with recording pyrometers and arranged so that the heat is under complete control at all times. The upper floor of shop No. 2 contains the coil winding department, where armature, field and transformer coils are wound and insulated.

In this shop every machine tool from the large punch presses to the small taping machines for insulating armature coils is driven by an individual electric motor. The

initial cost of many of the smaller tools is somewhat increased by driving each separately, but by this arrangement the machines are rendered independent of each other, so that an accident to one does not interfere with the operation of the others. The system becomes also extremely flexible. Not only can the tools be moved to the work, when it is desirable to do so, but they can be shifted easily from one portion of the shop to another without disturbing the main power connections. Other advantages are clear head room, better light, freedom from dirt, economy of operation (as power is only used when the machines are working) and reduction of the danger of accidents to employees. The greatest advantage to be derived from this individual drive, however, is the increased output, due to the fact that the machines can be run at the proper speeds to suit the work. As labor is the greatest single item of expense in a machine shop, a very small percentage of saving in its cost per year will more than balance a comparatively large initial increase in the expense incurred for tools.

Shop No. 3, a general view of which is shown in Fig. 3, is 462 feet long, the front portion being one story high and 176 feet wide, while the rear portion is 107 feet wide and two stories high. The two-story extension in the rear, a recent addition, is of ferroconcrete construction, and is faced with brick on the outside to match the other buildings. Both upper and lower floors are divided into bays by rows of columns, and on the lower floor two 10-

Fig. 2.—A View in the Foundry of the Allis-Chalmers Electric Works.

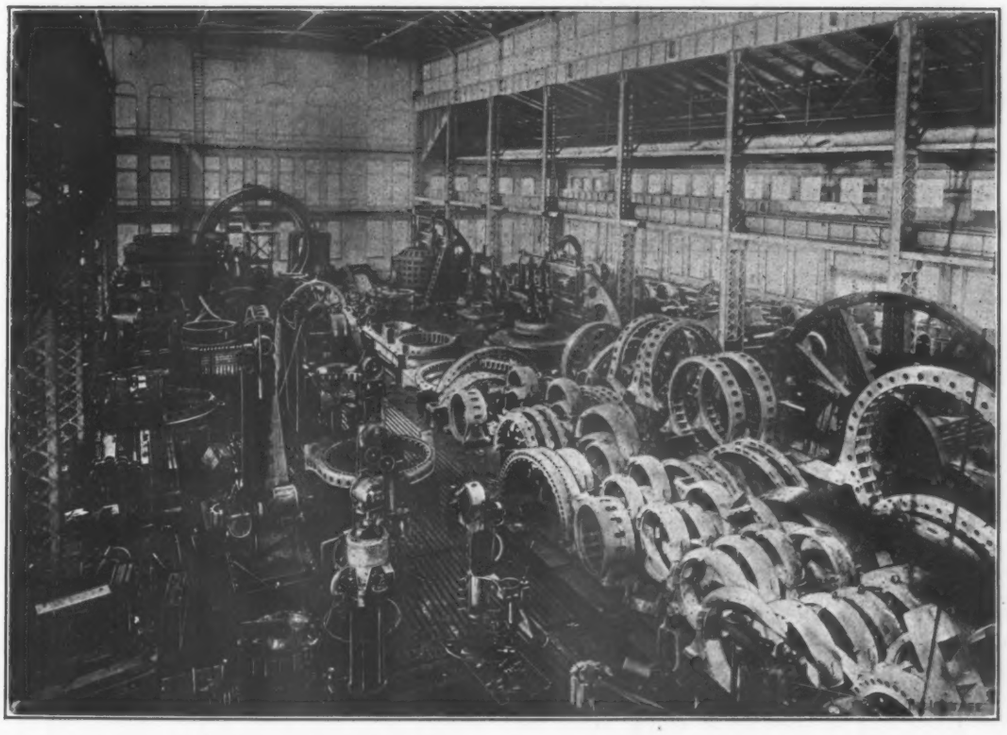


Fig. 3.—A General View in Shop No. 3, Where the Work on Large Machines Is Performed.

ton cranes are provided; the work on the upper floor being of a lighter character, two 5-ton cranes are installed. An elevator is located at about the middle of the extension. On the second floor are the tool room and brass department, for the manufacture of small brass parts entering into the construction of machines. The front portion of this unit is used for the construction of large machines and is divided into three bays. The central bay is 68 feet wide and 60 feet high under the roof trusses, and is equipped with a 60-ton traveling crane having a 50-foot lift. Each side bay is 48 feet wide, one served by a 20-ton crane and the other by one of 30 tons capacity. Part of the central bay is provided with iron floor platens for the use of portable drills, slotters, &c. Fig. 4 shows a few of the portable tools installed here equipped with motor drive.

The works power house and boiler plant are located alongside of shop No. 1. The power house equipment consists of two Allis-Chalmers 800-kw. 240-volt direct connected engine type generators, one of which is driven by a Lane & Bodley engine and the other by an Allis-Chalmers-Reynolds cross compound Corliss engine. There is a further equipment consisting of a small 100-kw. unit and an air compressor outfit for operating pneumatic tools used in various operations throughout the shops. Two artesian wells furnish the entire water supply for engines and fire service. A water storage reservoir is provided for fire protection with a fire pump in connection with a complete sprinkler system for all buildings. The engines are run noncondensing. The boiler house equipment comprises six 250 horse-power Cahall vertical water tube boilers, fitted with Mansfield chain grate stokers.

The service building, 53 x 261 feet, is located between shops Nos. 2 and 3. A wire storage room and locker and washroom for employees occupy its lower floor. The upper floor is fitted up as dining rooms for factory and office employees.

The administration building is 100 x 100 feet and two stories high. It provides accommodation for the various administrative offices and departments, drafting room, engineering department, purchasing department, superintendent's office, &c.

The general plan of buildings and grounds, shown in Fig. 1, gives the layout of standard gauge railroad tracks in yards and buildings. In addition there is a complete equipment of narrow gauge industrial railroad interconnecting the various shop units. All the yard track is equipped with overhead trolley, and motor driven cars, equipped with electrically operated cranes, are used for loading and unloading material and conveying it between the shop buildings.

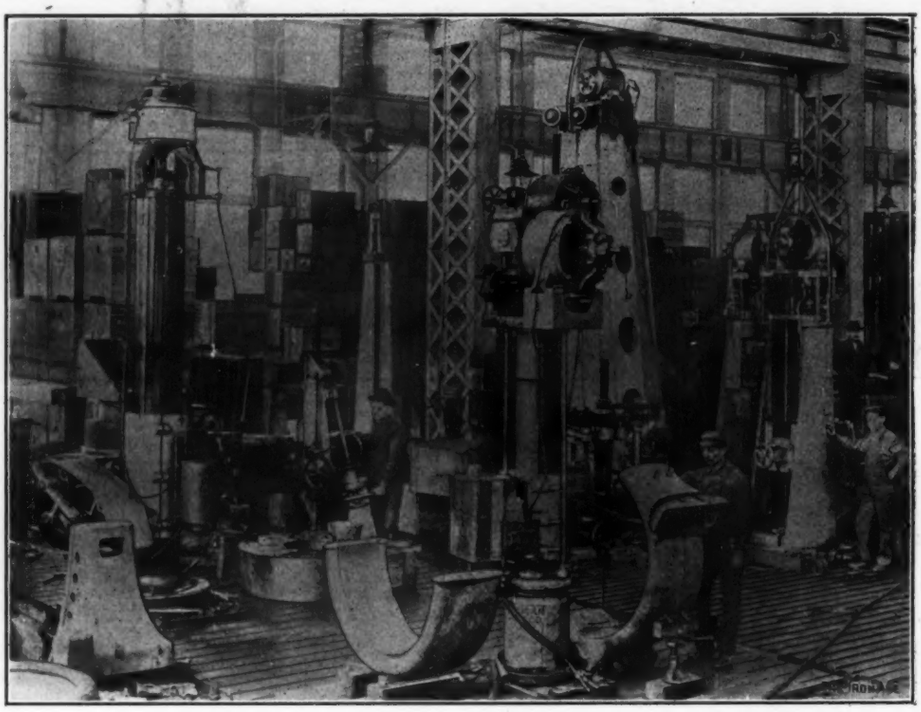


Fig. 4.—A Few of the Motor Driven Portable Tools in Shop No. 3.

The Coal Production of Alabama in 1905.

Statistics of the coal production of Alabama during 1905 have been compiled by Edward W. Parker of the United States Geological Survey. They show that the total production of the year was 11,866,069 net tons, which had a value on the spot of $14,387,721. This was an increase in tonnage of 604,023, or 5.3 per cent., and a gain in value of $907,610, or 6.7 per cent., over the value of 1904. Compared with 1903, the year of largest production heretofore, the output in 1905 shows an increase of 211,745 net tons in amount and of $140,923 in value. The average price per ton in 1905 was $1.21, as compared with $1.20 in 1904 and $1.22 in 1903.

The returns show that 19,595 men were employed for an average of 225 days. The average output per man was 605.6 tons for the year, or 2.69 tons per day, as compared with a daily output of 2.93 tons per man in 1904, when 17,811 men worked an average of 216 days and produced 11,262,046 tons of coal. The yearly tonnage per man in 1904 was 632.3 tons, or 26.8 tons more than in 1905.

One of the notable features in connection with the production of coal in Alabama in 1905 was the large increase in the number of mining machines used and in the amount of machine mined coal produced. There were 196 machines in use in 1905, as against 141 in 1904, while the amount of coal undercut by machines increased from 577,317 net tons in 1903 to 741,170 tons in 1904 and 1,786,479 net tons in 1905.

The boring of another Swiss tunnel through the Alps to connect with the Simplon Tunnel, which was recently completed, has been decided upon. The estimated cost of the new tunnel is $15,000,000.

The United States Geological Survey announces that the production of Portland cement in 1905 amounted to 35,246,812 barrels, valued at $33,245,867. This is a gain of 8,740,931 barrels in quantity and $9,890,748 in value over the output of 1904, which amounted to 26,505,881 barrels, valued at $23,355,119.

The American Society for Testing Materials.

Ninth Annual Meeting at Atlantic City, N. J.

Each successive meeting of the American Society for Testing Materials shows an advance over the preceding one. That which was held at the Hotel Chalfonte, Atlantic City, on Thursday, Friday and Saturday, June 21-23, had a larger attendance than any other, and in the variety and character of the papers presented led most of its predecessors. Of particular interest was the discussion on the corrosion of iron and steel. In respect to specifications, the report of Committee A on Standard Specifications for Iron and Steel was first in interest to metallurgists and all connected with iron and steel manufacture, as well as to the testing engineers of the railroads. The report, while not as much discussed as those of this committee in previous years, was important as indicating that buyers and manufacturers of steel rails are not likely to agree on a standard rail specification, and the controversy of some years' standing promises to continue. The meeting gave abundant proof of the larger place cement and concrete are taking in engineering work, and the corresponding increase in the literature of testing and experiment in these lines. In new matter on preservative coatings the meeting yielded less than several in recent years.

A feature of striking interest was the address, with lantern slide views, on earthquake and fire effects in San Francisco, given by Richard L. Humphrey. No such collection of photographs has been put at the disposal of engineers, it is safe to say, dealing with the disaster of April 18.

The registration was the largest in the history of the society, having passed 200 on the morning of the third day. Some additions to the membership were made, and the secretary, Edgar Marburg, University of Pennsylvania, Philadelphia, hopes to receive further applications, so that the 1000 mark aimed at may be reached by the meeting of 1907.

THURSDAY AFTERNOON.

The opening session was called to order at the Hotel Chalfonte at 3 o'clock Thursday afternoon by the vice-president of the society, Robert W. Lesley of Philadelphia. He referred to the annual report of the Executive Committee which had been distributed among the members. It showed that in the past year the membership had grown from 677 to 835. For the first time in its history the society had reached financial independence, and the contributing members had been notified that their support would not be required this year. The Executive Committee expects to publish in a separate volume the 18 standard specifications thus far adopted by the society, with others now in preparation. The treasurer's statement accompanying the report of the Executive Committee showed receipts of $6019.54 and a cash balance June 19, 1906, of $495.18.

Memoirs of American Engineers.

A pamphlet of 60 pages by Prof. Gaetano Lanza, Boston, was distributed among those present. It contained a number of sketches under the title "Memoirs of Deceased American Investigators Who Have Contributed in a Marked Degree to the Advance of the Testing of Materials." They are William Wade, John A. Roebling, Thomas J. Rodman, James B. Eads, Theodore T. S. Laidley, Henry Flad, W. E. Woodbridge, Quincy A. Gilmore, William H. Paine, Alex. L. Holley, Lester A. Beardslee, Robert H. Thurston, Louis F. G. Bouscaren, George S. Morison, John B. Johnson, Alfred E. Hunt. A vote of thanks was given to Professor Lanza for his painstaking work.

A paper was presented by Allerton S. Cushman of the Department of Agriculture, Washington, D. C., on the "Development of the Test for Cementing Value of Road Materials." P. L. Wormeley, Jr., followed with a paper containing "Notes on the Hardness and Abrasion Tests of Road Materials." A progress report was made by Dr. Charles F. McKenna, chairman of the Committee on Standard Specifications and Tests for Sewer Pipes. He said that the question of importance now before the committee is the percentage of allowable defects in sewer pipes, both clay and cement.

In presenting the report of Committee P on Fireproofing Materials Ira H. Woolson, Columbia University, New York, said that in its search for information the committee had published cards in 20 technical journals in the United States and abroad, asking for the results of experience with fireproofing materials. But one reply was received, that coming from Germany. The committee presented the results of 63 tests made in this country, chiefly in New York, and of 17 tests in England. The committee particularly asked for suggestions on standard tests for reinforced concrete floors.

A progress report of Committee Q on Standard Specifications for the Grading of Timber was read by R. S. Kellogg. In the discussion on this report it was stated that the Bureau of Forestry would no doubt afford this committee valuable information as to the extent to which each of the various defects defined by the committee's report affects the strength of timber.

The result of the ballot for officers for the ensuing two years was announced at the close of the afternoon session. The following were chosen, all being the present incumbents: President, Charles B. Dudley; vice-president, Robert W. Lesley; secretary-treasurer, Edgar Marburg; member of the Executive Committee, James Christie.

THURSDAY EVENING.

Secretary Marburg read a cablegram at the opening of the evening session from the secretary of the International Association for Testing Materials, conveying wishes for a successful meeting. Cable greetings came also from Dr. Dudley, the absent president. Dr. Dudley sailed for the United States on Wednesday, June 20.

Address by the Vice-President.

The annual address was made by Vice-President Lesley, whose subject was "The American Society for Testing Materials: Its Past and Future." Mr. Lesley traced the history of the society, recounting its early viscissitudes, and showing by reference to a chart the turn in the tide and in recent years the very rapid growth in membership, with corresponding extension of the society's influence. He laid stress on the field that existed for such a clearing house for the specifications of the various scientific associations. Tributes to the usefulness of the society have been paid by foreign engineers. The British Committee on Standard Specifications has commended the specifications of this society, expressing the hope that the American and British specifications would form the basis of an international specification.

The original organization was formed as the American section of the International Association for Testing Materials, the meeting being held at the Engineers' Club, Philadelphia, on June 16, 1898, 20 persons responding to the call of Gus. C. Henning. The membership grew from 70 in 1898 to 175 in 1902. Then came the doubling of the membership in a single year under the vigorous efforts of Secretary Marburg, and from 349 in 1903 it went to 485 in 1904, 677 in 1905 and 835 in 1906. The speaker paid a tribute to Dr. Dudley, the society's president, for the remarkable series of papers on the philosophical and scientific side of testing materials he had furnished in his annual addresses. A policy which had contributed much to the success of the society was that which provided that on all standing committees concerned with subjects involving commercial interests an equal numeric balance be preserved between engineers, scientists and the representatives of the consumers on the one hand and manufacturers or their representatives on the other, the permanent chairmanship being vested in a member belonging to the former class.

In concluding his address, the vice-president hoped for

the day when a great central testing laboratory might be established under the auspices of the society, either with the co-operation of the Government or as a separate institution, made possible by the gifts of men successful in industrial pursuits. "Such an institution should be one not devoted merely to commercial testing, not competing with organized laboratories, but it should be rather a supreme court of testing, to which the public would look for the final decision after the case has been argued in the lower courts, and whose conclusion, supported by the reputation, the intelligence and the ability represented in this body, would be conclusive and final." The address, particularly the closing suggestion, was received with approbation.

J. W. Howard presented, with the aid of lantern slides, the results of concrete column tests at Watertown Arsenal, the views making a very interesting study in this subject. The speaker was followed by Robert A. Cummings, Pittsburgh, who gave details of experiments conducted at Stuttgart, Germany, showing the comparative strength of spirally reinforced and vertically reinforced columns. The ratio of strength was 2.5 for the spiral reinforcement to 1.

Views of San Francisco Wreckage.

Richard L. Humphrey gave an exceedingly interesting address on "Some Effects of Earthquake Shock and Fire on Materials and Buildings at San Francisco." Mr. Humphrey had taken some 400 photographs in a tour of inspection at San Francisco and vicinity, and in the course of his address many of these were thrown upon the screen. He first gave a number of views of the San Bruno fault, which has been known for some years to exist in the rock formation of California, extending from northwest to southeast and passing through San Francisco. The San Francisco earthquake was the result of compressive action along the line of this fault, the earth's crust on the west side of the fault moving north for a distance of 12 feet. Views were given showing how the abutments of bridges had been shoved away from the structures, how aqueducts crossing the fault had been violently broken and how trees had changed position with reference to buildings alongside of which they grew. Fault scarps due to compressive action were traced through California for 300 to 350 miles. Mr. Humphrey's views showing the effects of earthquake and fire on the buildings of San Francisco were remarkably good. His conclusions in general were in line with those given in the article by George Simpson which appeared in *The Iron Age* of June 7, 1906. The inadequacy of terra cotta for flooring was fully demonstrated, the earthquake having shaken down this material from floor after floor. The buckling of steel columns was illustrated by views taken inside many of the wrecked buildings. The address was received with emphatic appreciation.

FRIDAY MORNING.

Separate meetings were held Friday morning by the Section on Iron and Steel and the Section on Cement and Concrete. At the former J. P. Snow, bridge engineer of the Boston & Maine Railroad, Boston, read a brief paper on "The Corrosion of Structural Steel as Affected by Its Chemical Composition." Mr. Snow's inspections of structures built 12 to 14 years ago partly of steel and partly of wrought iron showed some parts entirely gone, other parts reduced to lace work, and still others uninjured by corrosion. A pair of lateral brace angles crossing each other presented the spectacle of one angle completely rusted through and the other only slightly specked. The conditions of painting and of exposure were alike. The well preserved parts were iron, and those greatly corroded were steel. The writer suggested that chemical properties might be responsible for the differences, and asked that the society investigate the subject with a view to providing a remedy.

Electrolysis in Structural Steel.

Maximilian Toch, New York, presented a report detailing a series of experiments on the electrolytic corrosion of structural steel, particularly grillage beams supporting columns and base posts, which are either in the ground or surrounded by concrete and partly above the ground. The experiments proved to the satisfaction of the writer that electrolytic corrosion of structural steel embedded in concrete or sand takes place only at the anode, and there with great violence; further, that the cathode is protected by the electrical current. The popular impression that cement protects against all kinds of corrosion is fallacious. The anode not only rusts violently, but a molecular increase of volume may take place, which will split the concrete shell. Another conclusion arrived at was that electrolytic rusting of grillage beams of buildings need not be feared if the structural steel be protected by good insulating material, but the insulating medium should form a bond with concrete. The speaker suggested that if a large sheet of zinc could be buried in the ground and the zinc made anode and the building cathode it would probably be possible to corrode the zinc and save the steel of the building.

A discussion followed, which was quite generally participated in. Professor Howe referred to the common practice of calling steel "steel," no matter how manufactured or to what purpose devoted. There is less difference, he said, between wrought iron and tube steel than between wrought iron and high carbon and spring steels. One danger in connection with this subject is that of relying on small scale experiments. This applies to the suggestion of using zinc at the foundation of buildings to prevent the corrosion of steel. Zinc would be extremely effective where electrolytic action was maintained over short distances, but it is a question whether it would be effective for long distances. It is a question also what would happen to the steel in buildings where zinc had been used in the way suggested, after the zinc had ceased to oxidize.

Professor Howe presented in connection with the discussion of this subject a written contribution, which appears elsewhere in this issue, supplementing it with a verbal statement of results of tests made at Columbia University upon Spellerized steel used in the manufacture of tubes. The result of one set of tests showed that the average loss from corrosion in grams per square inch was 0.0576 for steel and 0.0660 for charcoal iron and muck bar iron.

The Electric Conductivity of Steel.

Mr. Cushman referred to experiments he had made illustrating the difference of potential between pieces of steel, presumably made under the same conditions. For example, he had taken two steel needles from the same package and by attaching to a galvanometer had established the fact of differing potential. If such a difference exists between pieces of steel manufactured in the same way, how much greater differences of potential will be found in the various materials of a steel structure? It seemed impossible to him to consider any structure like a building as cathode. He therefore questioned the feasibility of employing zinc to prevent electrolytic action in the steel of a building. To him the question was not any more why wrought iron should differ from steel in susceptibility to corrosion, than why two steels differed greatly in rate of rusting. From the standpoint of electrolysis, the important consideration must be the amount and proportions of various impurities. Manganese affects electrical conductivity in a great degree. The chief need in connection with this subject is experimentation.

James Christie had noted particularly the behavior of sheet metals used for roofing and sheathing purposes. The belief is generally held that sheet metals to-day do not give the service of the sheets of some years back. The speaker knew of roofs that had been in existence 20 to 30 years, with occasional painting, and they are in good condition to-day. Alongside are roofs that have been renewed two and three times in the past dozen years. It is now considered poor policy to use black metals, whether iron or steel, for roofing, even though painted. To some extent the same applies to galvanized metals. Some experiments have sustained the view that in its early stages corrosion is more rapid in steel than in iron. Iron takes the galvanized or tinning better than steel, the rougher surface of the iron probably giving a better hold for the coating. It is possible that some material will yet be discovered that may be introduced in the steel while in

process of manufacture, which will reduce its susceptibility to corrosion.

Reference was made by Maximilian Toch to the protection to cast iron afforded by the skin formed by the contact of the molten iron with the silicates of the molding sand. Professor Howe observed in this connection that while cast iron resists corrosion in its natural state, rusting soon followed the removal of any portion of the skin.

Mr. Snow had found the difference between iron and steel most pronounced in structures exposed to locomotive engine gases. Steel corrodes very much more rapidly than iron. He cited two bridges 500 feet apart. One was built of wrought iron 20 years ago, the other of steel 14 or 15 years ago. Portions of the iron bridge are not affected at all, while in the case of the steel bridge some members are now half gone.

Corrosion of Tube Steel.

Mr. Speller considered it very unsafe to draw general conclusions from observations in a particular line. Much depends on the use to which the steel is applied. It is not fair to gather data concerning sheets and wire and apply them, for example, to steel pipes. The National Tube Company has been gathering a vast amount of data bearing on the relative corrodibility of steel and iron, carrying on both laboratory and service tests. It had found that charcoal iron tubes from locomotives on its own connecting railroad were just as badly pitted as steel tubes in similar service. From tests made on steel and iron used in pipe lines it had been found that where the two were used side by side the wrought iron corroded as much as the steel. It is to be remembered that steel is very generally in use to-day and that there is relatively a small amount of iron used, so that comparisons side by side are not often possible. The speaker said that his company is now working on a steel the nature of which it is not prepared to explain, but which so far has given better results than either steel or iron at present in use. This steel would provide a protection for the surfaces of pipe and it was believed would give excellent results.

George Schuhmann of the Reading Iron Company referred to oil well casing which had been taken out after seven years of service. Iron casing came out in as good condition as at first, while steel casing in the same service showed signs of great deterioration. In connection with the new steel to which reference had been made it was a fair question whether this particular steel would not have stood just as much before being "Spellerized" as after. Mr. Schuhmann recounted some experiences with tubes that had been piled in the mill yard for some time and that were afterward reheated preparatory to being rolled down to smaller sizes. With iron tubes it was possible thus to "warm up" stock that had been in a yard pile for some time. Where the tubes were of steel, and it was desired to draw upon the yard pile in the case of an emergency order, it was found that portions of the surfaces were a good, smooth blue, but there were also rust patches, which made it absolutely impossible to use these tubes, and they were sent to the scrap pile.

Iron Roofs in Service.

Edgar S. Cook of the Warwick Iron & Steel Company, Pottstown, Pa., said that in 1880 his company put over its cinder pit a corrugated iron roof furnished by the Phœnix Iron Company. The roof is still in use and has not been painted in five years, yet it is in far better condition than another roof which has been in use only four years and not exposed to the sulphurous gases of the slag pit. This last roof was sold to the company for iron. The trouble, he thought, was due to the low prices for skelp iron, which led to such sharp competition that material from the busheling furnace was very largely used, which did not compare in durability with skelp from puddled iron.

Charles L. Houston spoke of a roof he had been examining, half of which was put on in 1891. This is now perfectly good. The other half was put on two years later and has had to be replaced. Under the glass the material from the two portions of the roof looked alike, but the roof put on later was from iron made by the busheling process from material containing a good deal of steel scrap. Probably an all-steel roof would have lasted longer.

Mr. Voorhees referred to the good illustration of the protecting action of silicate of iron on the surface of cast iron found in car wheels. The chilled tread, which had been cast against a chilled iron surface, showed much more rapid corrosion than the parts of the wheel which were in contact with the sand in the mold.

Corrosion of Wire Fencing.

Mr. Cushman, who explained that he had done a great deal of investigating into the corrodibility of steel in the interests of the farming community, had found that the horizontal wires in a woven wire fence do not all last equally well. Some showed rust all along, while others were as good as the day they were put up. Possibly these differences were due to the differences between the top and bottom of the ingot. He had gathered a mass of evidence from users of wire fencing, showing that the lower wires, which were kept wet by weeds and by snow, invariably last longer than the upper wires. The explanation was probably electrolytic action. The lower wires, being well grounded, were not subject to the same differences of potential that are established in the upper loops. In this connection Professor Howe observed that as wire leaves the die with a certain amount of coating in the drawing, it might be possible that the upper wires in a wire fence, being cut by wind and dust, are sooner bared than the lower wires.

Mr. Carter of the Sligo Iron & Steel Company thought the trouble with steel was that the manufacturers worked too much from their scrap piles. This was true, even of crucible steel manufacturers. While it is impossible to make a bar of steel uniform from end to end, it is not impossible to do this with a bar of iron. His company had not had a car of material returned in eight years. None of its product was made from the scrap pile. He thought more iron would be manufactured and used in the United States, if it were not for the fact that the manufacturer is constantly trying to make the most money with the least outlay.

At the conclusion of the discussion, a motion of Professor Marburg was carried providing for the appointment by the Executive Committee of a Committee on the Corrosion of Iron and Steel.

Heat Treatment.

Professor Howe, as chairman of Committee F, on the Heat Treatment of Iron and Steel, presented a progress report. The committee has been investigating systematically low carbon and high carbon steels, but is not yet ready to publish its conclusions. The speaker showed a vertical section of the furnaces used in the experiments. The bars used are from 10 to 16 inches long, preferably the latter, and it is very difficult to get the uniform temperature over every part of the surface of the bar. In the furnace used there is an inner and an outer muffle. The bars are poised in the inner muffle and are thus heated solely by radiation from the inner muffle, which itself is heated by radiation from the outer muffle. The use of electric resistance in these experiments has been abandoned, and gas is now employed for heating. At the very high temperatures used the platinum had broken down so rapidly as to make the cost of electric heating almost prohibitive. A paper by George B. Waterhouse on the same subject was presented by title.

William Campbell read a paper detailing the results of experiments conducted at Columbia University, showing the effect of heat treatment on high carbon steels.

Effects of Heat on Large Masses.

In discussing the paper Mr. Christie said that it is now quite common practice to heat eyebar steel to 1500 to 1600 degrees and even as high as 1800 degrees, but the material is not held long at these high temperatures. In the discussion following Mr. Bostwick called attention to the importance both of the time factor and of mass in the heating of steel. Eyebars are heated in annealing far beyond any theoretical temperature. In many other forms of steel also, in order to get the maximum elongation and reduction of area, it is customary to go to tem-

peratures much beyond the critical temperature. If experiments could be made, taking account of the factor of mass, as well as of that of time, they would be very valuable. In response to an observation by Professor Howe that the laws governing the heating of eyebars and other low carbon steels are very different from those of high carbon steels, Mr. Bostwick said that he had noticed variations from the theoretical results in dealing also with high carbon steels, such as pinions, rolls, &c. In annealing rolls 30 to 36 inches in diameter the heat was applied very gradually, from two to ten days being consumed. The steel was then maintained at varying temperatures, such as would secure absolute uniformity, yet the theoretical results were not realized. With large pieces the element of lag was very important, the effects expected at given temperatures not being realized.

E. O'C. Acker of Bethlehem, Pa., thought a good many mistakes had been made in deriving conclusions as to the heat treatment of steel from investigations dealing with small test pieces. Size has very much to do with the effects of various temperatures. Large pieces hold heat longer and the changes in structure following the applications of various temperatures are not what would be found in smaller pieces.

Professor Howe called attention to the fact that there is a rather narrow range of temperature in which cementite passes into graphite. He called upon Dr. Moldenke and James A. Beckett to say whether the crystalline structure was found in malleable castings where the heat applied had passed beyond the critical temperature. In reply it was stated that where the annealing oven was heated to too high a temperature the castings came out white; also that good malleable castings having a black, velvety surface might be turned perfectly white by being heated to a cherry red and plunged in water.

The question was asked whether a bar which had been made crystalline by being rolled at too high a temperature can be restored by heating again above the critical temperature and allowed to cool. It was answered that this is being done repeatedly with eyebars and other forms of steel. Bars with a crystalline structure due to overheating can be put through annealing ovens and the structure brought to the proper refined condition. In general it was stated that any injury done by overheating would be completely overcome by reheating, provided it had not gone so far as to cause mechanical defects, such as opening of cracks. The further the injury had gone the longer the time required to correct it.

FRIDAY AFTERNOON.

The report of Committee A on Standard Specifications for Iron and Steel, W. R. Webster, chairman, came up at the opening of the afternoon session. A printed statement was submitted of the various matters discussed at the meetings of the committee held since the last convention. One year ago the committee's recommendations on various features of its rail specifications were referred back to it for further consideration, with a view to harmonizing the proposed specification of the society as far as possible with those of the American Railway Engineering and Maintenance of Way Association and the American Society of Civil Engineers.

Differences on Rail Specifications.

The committee's report for the most part reaffirmed its recommendations of a year ago. It was impossible to reach an agreement on some of the disputed points and the committee brought these again before the convention, submitting at the same time a statement from a subcommittee which had been appointed to put in form the arguments for and against the proposals of the committee. This statement was as follows:

DROP TEST.

It is thought that the change from a test "from every fifth blow" to "from each blow" should not be made because (1) the specifications in their proposed modified form provide that the test shall hereafter be taken from the top of the ingot, and (2) that such a requirement in a general specification would impede the work of the mills unnecessarily.

SHRINKAGE CLAUSE.

The following reasons for and against the proposed modified form of this clause are offered:

For.—Because service conditions in the track do not indicate that greater shrinkage produces poorer wearing rails than rails manufactured under a shrinkage requirement of 1 inch less than that proposed. Further, the resulting decrease of output at two-thirds of the mills in the country renders it prohibitive to adopt the lower shrinkage requirement proposed in the other specifications.

Against.—It is generally admitted that colder finishing of steel at or near the critical temperature results in betterment of the structure. A number of experiments on rails in track rolled at lower temperatures but similar in other respects have almost invariably shown better wearing qualities.

DISCARD.

The reasons for and against the existing clause governing discard may be stated as follows:

For.—On account of the essential and necessary variations in practice at different mills, and the fact that even under the best conditions in any one mill, the unsoundness, if any, at the top of an ingot will vary; therefore a specification requiring "a sufficient discard" is better than one requiring a fixed amount of discard.

Against.—The number of breakages in rail has shown that the word "sufficient" as at present interpreted does not guard against brittle rails going into the tracks. The process of shearing should be as much a subject for inspection as any other part of rail mill practice, and a definite specification which will give the inspector some guide is necessary. While a fixed percentage of discard may cause the loss of some good material, it is reasonably certain to insure the elimination of most of the bad. The word "sufficient" is interpreted by the mills as sufficient from their point of view, and the inspector who represents the consumer at the mills is allowed no say in the matter. Moreover, in making steel for other purposes, such as axles, eye bars, &c., a heavy discard is made to insure good material, whereas the stresses and shock to which a rail is subjected are much greater than in the case of an axle or an eyebar.

CHEMICAL COMPOSITION.

The reasons for and against adherence to the present specifications governing chemical compositions may be stated as follows:

For.—While it is conceded that less phosphorus may be better in general, we are met in this case by the practical impossibility of reducing the percentage of this metalloid in connection with the Bessemer process, for the reason that a sufficient supply of low phosphorus ore for producing the required large tonnage of rails is not available. As between 0.10 and 0.085 phosphorus the advantage of the lower amount is questionable, some results from rails made under the lower requirement having been unsatisfactory. Considering that it is desirable to take the drop test from the top of ingot, the present percentage of carbon should be maintained as consistent with the hights of drops specified. The percentages of carbon may be increased provided suitable reductions in hights of drop test be made.

Against.—Phosphorus is universally admitted to be an unmixed evil in steel, and the lower we can keep its percentage the more use we can make of proper hardeners, thereby adding to the wearing qualities of rails without the danger of brittleness caused by higher phosphorus. With an allowable percentage of 0.10 for phosphorus, we do not dare to make rails hard enough to wear well.

STRAIGHTENING.

The reasons for and against the omission of a definite requirement for permissible camber may be stated as follows:

For.—Since the camber in rails depends largely upon the distribution of the metal in the section, it is manifestly impossible to stipulate a maximum amount covering all sections. Further, since all mills aim to deliver rails as straight as possible to the gag presses in order to insure greater output, it seems unfair to penalize them on occasions when it is found impossible to control this.

Against.—In many mills the rails come to the straightening presses in all conditions from nearly straight to very badly cambered. In the case of a badly cambered rail, the first operation in straightening is to hit it with the gag at intervals of about 18 inches throughout its length. When it is considered that the material is thus strained beyond the elastic limit at each blow, the necessity of reducing this gagging to a minimum becomes quite apparent. Excessive gagging often causes a crack in the rail, and rails which have been subjected to the same should be treated like rails defective in other respects, that is as "second quality." This will insure their being laid in places where they will not be required to stand the most severe service. Such rails should be marked as No. 2 before straightening, as it is almost impossible to detect after straightening the rails which were too severely gagged. That specifications fixing the allowable limit of camber can be complied with is evident from the fact that some mills meet the proposed specifications in their present practice.

Railroad Requirements More Stringent.

The discussion following the presentation of the committee's report was participated in by Chairman Webster and by a number of representatives of steel companies and consuming interests. Robert Job of the Philadelphia & Reading Railroad thought that, in view of the fact that rails now in use wear very rapidly, a harder rail should be specified. He considered the carbon limits 0.55 to 0.65 proposed by the American Society of Civil Engineers for 90 to 100 pound rails to be far more in line with the best

results than the limits 0.45 to 0.55, proposed by this society's committee. He favored a phosphorus limit of 0.085 rather than 0.10. He added that to adopt the same specification reported by the committee last year would mean that this society's specification would be discredited and that the railroads would adopt those of the Civil Engineers and the American Railway Engineering and Maintenance of Way Association.

Mr. Christie believed the society should be careful about adopting something at variance with the specifications of the two prominent engineering societies mentioned. The very large interests involved should lead to conservative action.

Mr. Job moved to refer the matter back to Committee A, with instructions "to report at the next annual meeting a specification which shall give promise of correcting as far as possible the defective quality of rails obtained under existing specifications." This motion was adopted, after some effort had been made to have the mover withdraw the reflection upon rails as now manufactured which the motion contained. At the suggestion of Chairman Webster, a motion was passed requesting Committee A to formulate and present to the Executive Committee a scheme for subdividing its work. It was stated in this connection that if such action were not taken the committtee's present report would probably reappear at the next convention in substantially the form in which it now exists.

Specifications for Ship Material.

E. P. Stratton, chief engineer surveyor of the American Bureau of Shipping, opened the discussion on standard specifications for ship material. The rules of the American Bureau have been operative since 1900, and the speaker submitted its specifications that they might form a part of the record of the American Society for Testing Material. The specifications had been formulated in the interest of shipbuilders, shipowners, material manufacturers and underwriters. About 90 per cent. of the ship material now used in this country is tested in accordance with the rules of the bureau. The range in tensile strength provided for was 58,000 to 68,000 pounds for ship plates. The elongation is 20 per cent. in 8 inches. No chemical requirements are specified except on boiler steel. In the discussion that followed it was urged by several members that it would be best to follow American lines in any specification for ship material prepared by the society. Some things in Lloyds specifications apply only to British practice. William R. Webster urged that chemical requirements be incorporated, and suggested that a specification might be made which would harmonize the differences as to tensile strength between American and British specifications.

On motion the question of standard specifications for ship material was referred to the Executive Committee for the appointment of a committee.

Failures in Fire Box Steel.

Max H. Wickhorst presented a paper on "Fire Box Steel: Failures and Specifications." Accompanying it was an elaborate series of blue prints illustrating various conditions and tests. He said that in general fire box sheets failed in one of two ways: First, gradual failure, in which the sheet shows a good many small cracks, mostly vertical, being thickest radiating from the stay bolts and frequently running from one stay bolt to another in the same vertical row. Second, there may be sudden failure or rupture, the sheet showing a single crack from a foot to several feet long. The speaker classified the conditions under which failures occur in seven groups, the statistics showing that 71.7 per cent. of failures occur while the engine is being washed, and 17.9 per cent. while the engine is cold under other circumstances, leaving 10.4 per cent. for failures while the engine is hot. These figures suggested keeping the boiler continuously hot, and the use of a method of washing out where the temperature does not get below 150 degrees F. In a locomotive fire box the average temperature of the metal, if not protected by water, would probably run between 2000 and 3000 degrees. With scale ⅛ inch thick and with water in the boiler, the fire box and ends of tubes can readily attain a temperature several hundred degrees above that of the water, and in some cases will probably come to a low red heat.

The conclusions of the write are that the harder grades of fire box steel do not stand the abuses of overheating and of sudden changes of temperature satisfactorily, while very soft steel, while becoming badly corrugated and distorted, will still remain serviceable. In view of this fact the C., B. & Q. Railway has recently changed its requirements for fire box steel to a tensile strength of 50,000 to 58,000 pounds per square inch instead of 55,000 to 65,000 pounds.

Mr. Wickhorst considered that the problem was not so much one of the quality of steel as of suitable treatment of water supply and proper arrangement for delivering feed water to the boiler and proper methods of caring for boilers. With attention given to these details he thought most of the complaints of poor steel would disappear.

Replying to a question as to the necessity for the very low sulphur requirements of some buyers of fire box steel, these being 0.03 and even 0.02 in some cases, Mr. Wickhorst doubted if high sulphur ever caused failure in fire box sheets. He considered 0.035 amply low.

Charles L. Huston, vice-president of the Lukens Iron & Steel Company, Coatesville, Pa., presented an interesting paper and lantern slides showing the results of experiments on the "Segregation of Steel Ingots in its Relation to Plate Specifications." Detailed reference to this paper will be made in a later issue.

The Section on Preservative Coatings had a separate session Friday afternoon. S. S. Voorhees, chairman of Committee E, presented a progress report on "Preservative Coatings for Iron and Steel," and Arthur B. Harrison read a paper entitled "Protective Coatings for the Preservation of Steel." Other papers were, "Practical Testing and Valuation of Japan," by Robert Job, and "Testing of Shellac Varnish," by A. C. Langmuir. At the general session on Saturday the Executive Committee was authorized to solicit contributions for the work of Committee E in testing preservative coatings for iron and steel.

SATURDAY MORNING.

Walter A. Wood, chairman of the Committee on Standard Specifications for Cast Iron and Finished Castings, reported that the American Water Works Association is taking up the matter of specifications for cast iron pipe. The committee has had some conference with the committee of the above association. As the association is to have a meeting next month and may act on this matter, Mr. Wood's committee was authorized to take up the question again with a view to agreeing with it on a specification.

The Coke Specification to be Widened.

Dr. Richard Moldenke reported for the Committee on Standard Specifications for Foundry Coke. In the past year a set of tentative specifications was prepared and circulated for criticism, but the committee is not ready to make a definite recommendation, for reasons stated as follows:

For several years a change has been gradually taking place in the coke situation of the country; a number of new coal fields are being drawn upon for coke making purposes, and in addition new methods of operation are being applied. The result is that the so-called standard 72-hour coke made in the old beehive oven is no longer descriptive of what is being shipped under this name, and the best looking portions of every charge are put aside for foundry purposes and shipped as the 72-hour article. As the results obtained in the foundry with 48 or even 24 hour coke thus selected are equal to those from the straight 72-hour variety, it would seem desirable to eliminate this deceptive provision from specifications.

The advent of the by-product coke in the foundry industry has further modified the existing conception of what a foundry coke should look like, and hence your committee feels that in this time of transition it would be unwise to put forth a definite specification based entirely on experience with the Connellsville district, at least until further studies in connection with the production of coke have been made, thus doing justice to the maker as well as the consumer. These additional studies will include, first, investigations covering the proper sampling of coke. All the specifications in the world will be useless unless a properly representative sample is obtained.

Next is the chemical analysis of coke. This is to include

what is wanted in the examination, as well as the preparation of standard methods for determining the separate constituents. Thus the question of moisture determination, the total sulphur, the sulphur in the ash and the effect the latter is supposed to have on the iron under varying melting conditions.

Then come the physical tests of coke. Just what is required along this line and what may be properly omitted. Thus a moment of thought will show how worthless the crushing strength of a cube cut from a lump of coke is for representing a shipment, or for that matter of a hundred such cubes, no two pieces of the various parts of a charge being alike in structure.

Finally, a study should be made of the behavior of coke under what may be called service tests, that is to say, devising methods showing how it would behave in descending cupola or blast furnace and just what happens to a coke in being unloaded several times with a fairly high drop, &c.

Your committee has further been promised the active co-operation of the Government Fuel Testing Bureau in this work, and as the investigations will be equally valuable to blast furnace and smelter, we respectfully request that the American Society for Testing Materials enlarge the scope of our work by striking out the word "foundry" in the title of our Committee J, making it read "On Standard Specifications for Coke."

The recommendation of the committee was adopted.

Government Fuel Tests.

In the absence of J. A. Holmes, Mr. Belden reported briefly on the Government fuel tests at St. Louis, where 152 coals have been tested. Many coals were coked which had been considered non-coking. The bureau is considering the coking of hitherto non-coking coals by the addition of volatile hydrocarbons.

A progress report was made by Committee M on Standard Specifications for Staybolt Iron. The Baldwin Locomotive Works are now using the specifications presented to this society last year.

Uniform Speeds in Testing.

Paul Kreuzpointner, Altoona, Pa., chairman of Committee O, on Uniform Speed in Commercial Testing, presented the results of its work in the past year. Boiler steel plates and bar steel of varying carbons and forgings of tire and axle steel were used in the tests, 437 pieces being tested in various laboratories. The report presented a thorough résumé of the results. The committee recommended the adoption by the society of a maximum speed of 3 inches per minute for forging steel where a 20-inch section is used and a maximum speed of 6 inches for boiler steel where an 8-inch section is used. Within these limits it is believed the results of tests are safe and reliable. As to the elastic limit the committee recommended that in commercial testing it be taken with dividers at a slow speed. The committee did not find that any chemical change takes place in the test piece at high speeds in testing. What occurs is a slight condensation of metal, producing a small increase in strength without any decrease in ductility. A motion instructing the committee to report standard speeds for commercial testing was amended so as to refer the matter to the Executive Committee.

J. J. Kinkead, Schenectady, N. Y., presented a progress report of Committee T, on the Tempering and Testing of Steel Springs. The committee has subdivided its work under the heads of material for springs, tempering of springs and design of springs. It is collecting the records of the deflection of springs, getting data as to maximum and minimum loads for each deflection.

Specifications for Boiler Steel.

The report of Col. E. D. Meir of Committee R, on Uniform Specifications for Boilers, was read by title in the absence of the chairman. It shows that a joint meeting of committees of the American Association of Steel Manufacturers and the American Boiler Makers' Association was held on December 15, and an agreement was reached on the following:

Specifications for Boiler Steel.

	Tensile strength. Pounds.	Elongation in 8 inches. Per ct.	Sulphur. Per ct.	Phosphorus. Per ct.
Flange or boiler steel*	55,000 to 65,000	25	0.04	{ 0.06 acid. 0.04 basic.
Fire box steel	52,000 to 62,000	26	0.035	0.035
Extra soft steel	45,000 to 55,000	28	0.035	0.035

* When it is stipulated that the plates are to be flanged the physical properties shall be the same as required for fire box steel.

Elastic limit to be one-half of ultimate strength.

The boilermakers' full committee accepted the above specifications, which were sent to the membership in a circular of December 22, 1905. The percentages of phosphorus and sulphur were the main points of difference. On April 9, 1906, the Association of American Steel Manufacturers meeting at Pittsburgh passed a resolution agreeing to the above specifications, but declaring that as the basis for general trade the association will still maintain its specifications as revised February 6, 1903.

Colonel Meir's report further said that while there has been continuous agitation for a commission to revise the existing steamboat inspection law, there is no possibility of passing the bill at the present session of Congress.

F. P. McKibben gave the results of some "Tension Tests of Steel Angles."

SATURDAY AFTERNOON.

At the final session on Saturday afternoon a number of miscellaneous subjects came before the meeting. There was some discussion on waterproofing following a paper by E. W. De Knight. Professor Lanza spoke of the work of Committee K, on Standard Methods of Testing, saying that a set of questions has been prepared for submission to the various testing laboratories throughout the world. W. C. Du Comb, Jr., described a 600,000-pound Riehle testing machine, built for the University of Illinois, also a 400,000-pound machine, which had been furnished for the Republic Iron & Steel Company.

The matter of representation at the coming Brussels meeting of the International Association for Testing Materials was referred to the Executive Committee, as was also the appointment of a Committee on Specifications for Chain, Iron and Steel, Chains and Chain Cables.

Progress in Rebuilding San Francisco.

SAN FRANCISCO, June 16, 1906.—While San Francisco will not call either on the East or on foreign countries for anything like the amount of steel that some have supposed, there will certainly be a large quantity wanted here during the coming year and a half—much more than ever before. With those who have the means the steel frame is bound to be the most popular method of building. Even had there been no fire many of the old buildings that previously disfigured the city would have been removed, while steel and stone structures would have taken their place. There would have been at least $15,000,000 invested in these buildings. Now there will be more, fully $20,000,000, though some of these will not be completed for a couple of years.

There seems to be a rage for these buildings now among those not frightened by the fire. The number of steel buildings injured irreparably by the fire proves to be much less than at first supposed, and most of the lately built office buildings have the steel frames intact and only need the expenditure of a comparatively small sum in renovation. This of course lessens the number of new buildings. Among projects made public during the past few days are the following: The Western Real Estate Company, Market and First streets, a 14-story steel building; the East Street Improvement Company, a six-story class B building on East street, between Mission and Howard; the Humboldt Bank Building, on Market street, 17 stories, instead of eight, as originally designed; St. Dominic's Church, to be rebuilt of steel and concrete; five-story block on Second street, of the same material; on Van Ness avenue, near Pacific, by Dedmer & Stetson, a four-story steel building; the Pacific States Telephone Company, a six-story steel building.

The agitation in favor of the remission of the duty on structural steel does not make any particular noise, but it is safe to say that the vast majority of the people favor it. In view of this it might be a gracious act on the part of the structural steel manufacturers to reduce the prices to San Francisco consumers as much as they would be reduced by the proposed remission of duty, say, for a period of two years, and that would at once put a stop to the demand for the remission of the duty.

We have an annoying tie-up on our hands, as if fire and earthquake were not enough. There are now about 30 steam lumber schooners idle in the bay waiting for the sailors to recede from their demand for an advance of $5 per month in wages. The owners of the vessels would be willing to concede this if it would be the end of the demands on them, but of this they can obtain no assurance. Even if the trouble stopped there it would be bad enough, as the temporary buildings of the city are of course constructed of wood and the vessels are needed to bring it here, but the threat is to tie up all the water front, so that unless nonunion crews can be had there will be no clearances and a stop will be put to all the sea borne commerce of the port. This trouble has interfered more or less with our foreign trade.

The Palace Hotel will be rebuilt at a cost of about $3,500,000, and steps will be taken to begin clearing away the débris at once. J. O. L.

The Fogarty Detachable Rim Gear.

A new type of gear wheel, designed especially for trolley gears, but which can be applied to almost any split gear problem, is a wheel with detachable rims, patented by J. H. Fogarty, 126 Liberty street, New York. The wheel consists of a cast iron hub or center piece, to which the toothed rim is attached in two removable sections. The gear sections are made of steel and are interchangeable on any hub of the required pattern. The accompanying Fig. 1 shows the completely assembled gear and Fig. 2 the gear with one detached rim section ready to be put on. Where the web and the rims come in contact, as shown in the cross section, Fig. 3, they are

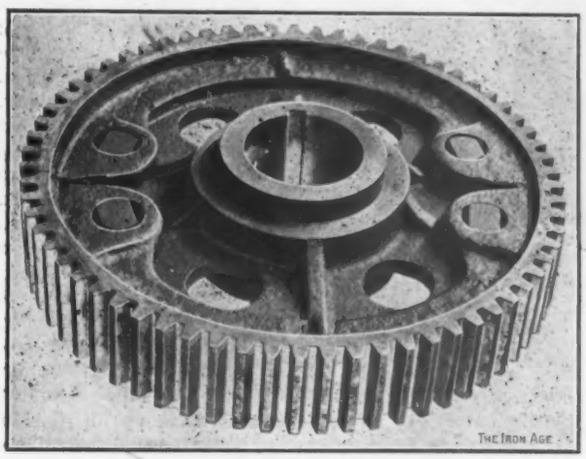


Fig. 1.—Assembled View of the Fogarty Detachable Rim Gear.

beveled in such a way as to make a perfect fit, thus preventing all lateral motion. Four heavy tapered wedge bolts 2 inches in diameter at their largest point, with 1¼-inch nuts, secure the rims to the gear web, and when they are tightened the bearing surfaces are brought solidly into contact. The nuts are locked with a patent arrangement that is claimed to preclude any chance of their working loose.

It is maintained that the great advantage of the gear is that when the hub is placed on the car axle it remains there during the life of the axle. When the gear teeth become worn out all that is necessary to replace them is to loosen the bolts and drop off the old sections, and it is stated this can be done and a new section put in position in less than half an hour. There is no need of a key or keyway, as in most split gears now used on trolley cars, and consequently the great amount of fitting and filing which is usually required is done away with. The average gear of this type has eight or more bolts to hold the gear together in a position to fit the axle, and the complaint has been that in many cases one of the numerous nuts has worked loose and the constant rattle has broken the gear. All this has been overcome on the Fogarty gear by pressing the hub on the axle by hydraulic pressure, and the only bolts used are the two wedge shaped contrivances on each section of the gear.

Another advantage claimed for the new gear over the old type is that in replacing a worn out gear it is not

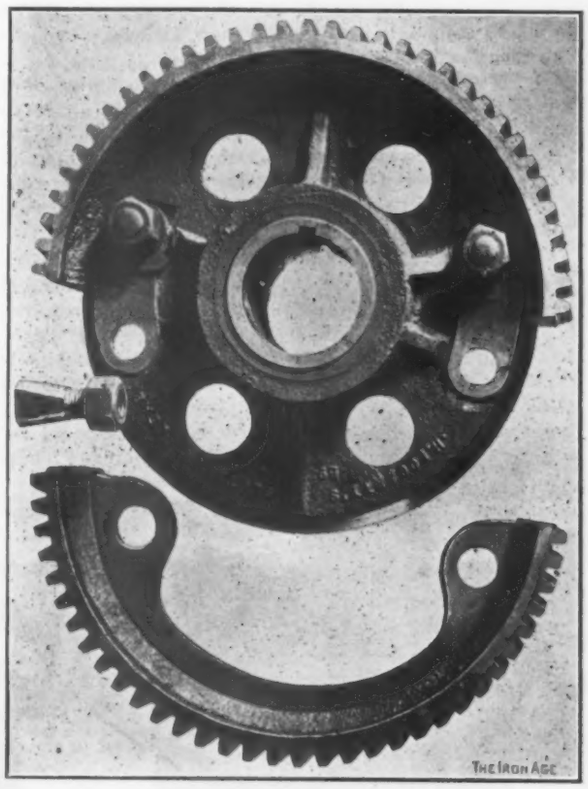


Fig. 2.—The Fogarty Gear with One-half of the Rim Removed.

necessary to press off the car wheel, and thus the danger which often arises of the wheel not fitting the axle again is avoided. It frequently occurs that wheels which have been pressed off and replaced have worked loose and caused serious trouble.

While it is designed especially for street railroad gears the Fogarty gear can be applied to almost any gear problem. The wheel has been given a trial by the Public Service Corporation of New Jersey and the Gen-

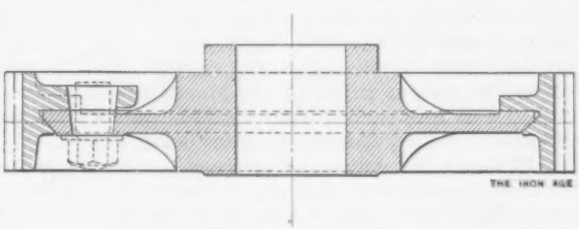


Fig. 3.—Cross Section of the Fogarty Gear, Showing the Joint Between the Web and the Rim Sections.

eral Electric Company is now using some of them. A large number of the gears were also recently sold to a street railroad concern in Portugal and they are reported to be giving good satisfaction.

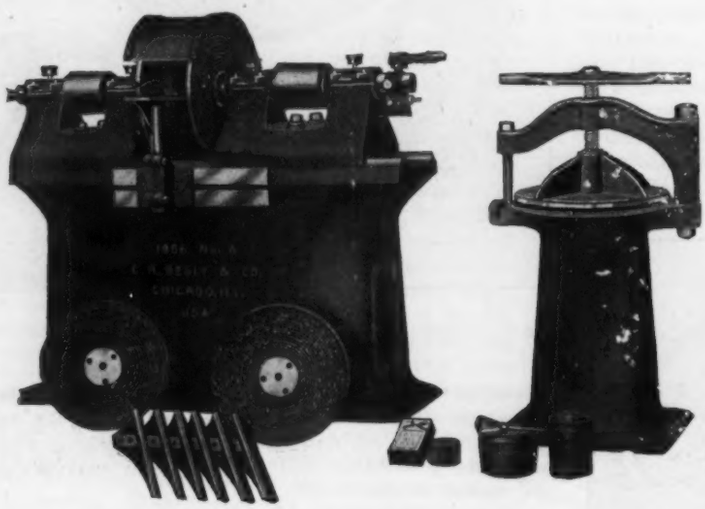
At Kansas City, June 22, Judge McPherson, in the Federal Court, fined the Burlington Railroad, the Armour Packing Company, Swift & Co., Nelson Morris & Co. and the Cudahy Packing Company $15,000 each for conspiracy to give and receive rebates. They were convicted two weeks ago. George L. Thomas of New York, a freight broker, was fined $6000 and sentenced to four months in jail, and L. P. Taggart, also of New York, was fined $4000 and sentenced to three months in jail. Appeals were filed in each case.

The Besly Double Head Disk Grinder.

Greater rigidity and power are features especially to be noticed in the redesigned double head disk grinder, known as No. 6, and placed on the market last year by Charles H. Besley & Co., Chicago. A special object of the increased power was to give the machine the ability to use to their full efficiency the new Helmet spiral circles manufactured by the same company.

Perfect alignment of the spindles is essential, that the disk wheels may run parallel and at right angles to the work table. On the principle of an engine lathe the heads rest on V's planed on the bed casting, and this construction insures alignment of the heads, at the same time tending to prevent emery dust from getting under them.

The greater demand which is now placed on machines of this class calls for the very best bearings possible. It has been the experience of the company that cast iron bearings lubricated with solid oil are the most satisfactory in disk grinders. For this reason the machine is regularly built with spindles of high carbon crucible steel, running in adjustable cast iron bearings of very large area, but when specially ordered the machines are equipped with phosphor bronze bearing bushings. These



The Besly No. 6 Spiral Head Disk Grinder and Disk Wheel Press.

bushings, which are ½ inch thick, are fitted into the main head casting and are split, so that the spindles and bushings are readily accessible. End motion of the spindles is controlled by adjustable keyed collars held in place by lock nuts on the end of the spindles and the end thrust is taken on hardened and ground collars of large area. This construction has been found to maintain the position of the spindles rigidly under heavy service.

To insure durability and accuracy the necessary precautions are taken in the manufacture of the machines, including the grinding and scraping of the cylindrical and flat surfaces. Another feature is the reduced amount of sliding surfaces, the sliding spindle having only about 1-inch movement endwise. It is entirely incased in its bearing housings, and these bushings slide with the spindle. By thus limiting the endwise movement of the sliding spindle to 1 inch, another desirable end has been secured—namely, that the disk wheel on the sliding spindle is always near to and rigidly supported by the main head casting. The machine is regularly fitted to be lubricated by compression cups and Helmet solid oil, and the bearing bushings have ample oil grooves and oil holes for using this lubricant. The travel of solid oil is always outward, which is preventive against emery dust working in.

The machine swings disk wheels 20 inches in diameter and smaller. The opening between the disk wheels is from 0 to 20 inches. The sliding spindle is brought up to the work by a pinion connected with a hand lever, engaging a rack on the back of the bearing bushing. This gives the operator a leverage of 20 to 1, enabling him with slight effort to bring the abrading disk against the work with sufficient pressure to get the best results. The rack and pinion mesh vertically, so that emery dust will not tend to lodge between them and cut them out. The bed casting has a 5½-inch opening for attaching an exhaust pipe to carry away the dust from grinding. The work rest bracket is especially rigid, and the T-slot in front of the bed and the V's on the bed readily adapt the machine for holding any apparatus which may be required on special jobs. Either or both heads may be removed at a moment's notice. The machine is equipped with spirally grooved steel disk wheels, and its weight, with the countershaft, floor press and accessories, is about 3500 pounds.

Steel Corporation Officers Visit Gary.

That an opportunity might be afforded to inspect the work preliminary to the erection of the new plant of the Indiana Steel Company at Gary, Ind., the regular monthly meeting of the presidents of the subsidiary companies of the United States Steel Corporation was held in Chicago on Friday, June 22, at the offices of the Illinois Steel Company, and on Saturday the party went to Gary by special train. The following were in attendance: W. E. Corey, president United States Steel Corporation; James Gayley, first vice-president; W. B. Dickson, second vice-president; W. R. Walker and John Reis, assistants to the president; J. A. Farrell, president of the United States Steel Products Export Company, New York; E. C. Dinkey, president Carnegie Steel Company, Pittsburgh; W. B. Schiller, president National Tube Company, Pittsburgh; C. W. Bray, president American Sheet & Tin Plate Company, Pittsburgh; Jas. H. Reed, Bessemer & Lake Erie Railroad, Pittsburgh; Thomas Lynch, president H. C. Frick Coke Company, Pittsburgh; G. G. Kerr, ore agent United States Steel Corporation, Pittsburgh; F. E. House, president Duluth & Iron Range Railroad, Duluth; W. J. Olcott, president Duluth, Missabe & Northern Railroad, Duluth; T. F. Cole, president Oliver Iron Mining Company, Duluth; Daniel Coolidge, president Lorain Steel Company, Philadelphia; H. Coulby, president Pittsburgh Steamship Company, Cleveland; W. P. Palmer, president American Steel & Wire Company, Cleveland; August Ziesing, American Bridge Company, Chicago; J. A. Hatfield, American Bridge Company, New York. The following officers of the Illinois Steel Company and allied interests were also members of the Gary party: E. J. Buffington, president; T. W. Robinson, first vice-president; G. G. Thorpe, second vice-president, and A. F. Banks, president of the Elgin, Joliet & Eastern and the Chicago, Lake Shore & Eastern railroads.

The *Railway Age* quotes an important railroad contractor as follows on the labor situation: "There is plenty of labor, but the difficulty is in inducing the men to work. The papers are filled with talk about a labor shortage and this makes them independent. We pay good wages, but laborers think more favorable conditions may be found elsewhere, and after working a few days or a few weeks they pull up and leave, feeling assured that there will be no difficulty in getting free transportation and employment on some other contract. If the newspapers would cease their talk about a dearth of labor the men would be contented to remain where they are securing good wages and the difficulty would be at an end."

As the advocates of a lock canal across the Isthmus of Panama won in the Senate June 21 by a majority of five, that type of canal will undoubtedly be constructed.

The Utilization of Waste Gases from Coke Ovens and Blast Furnaces.

On the occasion of the fiftieth anniversary of the German Society of Engineers, Dr. H. Hoffmann of Bochum delivered an address on the generation of power and its utilization in collieries and iron works. He pointed out that the waste gases from coke ovens and blast furnaces hardly suffice to cover the whole power requirements of the collieries and iron and steel works. One of the principal considerations is to thoroughly clean the waste gases. It is advantageous even to clean better than heretofore, the waste gases to be used for firing boilers and hot blast stores. The Zschocke firm is now building for a plant in the Rhine district what is believed to be the largest gas cleaning plant in the world, to handle 360,000 c. m. per hour in Horden and fan washers, the fan washers to call for 1000 horse-power.

The following figures may serve to teach what may be drawn from waste gases:

During the current year the production of coke in Germany will be approximately 20,000,000 tons, and the output of pig iron over 12,000,000 tons. There might be obtained from waste heat and from waste gases of Germany's present coke ovens by the utilization of the best designed steam engines about 500,000 horse-power. If all were by-product coke ovens utilizing the regenerative system, there could be obtained, with the aid of gas engines, about 550,000 to 600,000 horse-power. The fact that the difference is not larger is due to the type of the ovens. From waste blast furnaces gas there could be secured, with gas engines, about 1,000,000 horse-power; with the best steam engines and steam turbines, about one-half that quantity, and with engines such as they are now using for driving blowing engines, compressors, &c., about one-third of this quantity. These figures become significant when they are compared with the power requirements of the German collieries and iron works and when it is ascertained to what extent they are dependent upon driving with steam engines, under what conditions electrical power is suitable, and under what conditions direct gas engine driving is available.

Electricity has captured the small units. So far as the large units are concerned the steam drive still controls the field, except in the case of blast furnace blowing engines, in which the direct gas drive now preponderates. Generally speaking, it is true that there has not been gotten out of the steam drive all that it was capable of. The stimulating effect of competition has been missing. This is particularly true of hoisting engines. They are regarded as wasteful in steam, although they need not be. Although steam engine builders had at hand a gear for hoisting engines which was admirably adapted to the conditions of service and admitted of a low consumption of steam, the makers have not known how to oppose successfully electrical machinery in the one field of hoisting from main shafts. Efforts are now being made to recover the ground, and greater attention is paid also to the steam engine for reversing trains.

An exceptional success has attended electrical pumping, which has become more pronounced since the introduction into mining of the high pressure centrifugal pump. In the Ruhr basin about 100 electrical pumping installations are in service, or are under construction, which together can handle 350 c. m. per minute. The flow of water is but little more, but necessarily the capacity of the pumping plants must be several times larger than the flow of water. So far as their effective capacity is concerned the piston pumps still have the first rank, but so far as the amount of water handled is concerned the centrifugal pumps are first. Although the latter have a lower efficiency they are cheaper and require less attendance.

Electrical hoisting machinery has made rapid progress since builders have learned through the introduction of the Leonard gear and the Ilgner system of equalizing to handle the hoisting engine with accuracy and to counteract the extraordinary fluctuations in requirements of this class of engines. The electrical hoisting engines which have been built or are under construction have a capacity of hoisting 20,000 tons per 8-hour shift, but since German collieries are hoisting over 200,000 tons per shift the electrical system has still a wide field before it. The Siemens-Schuckert, Allgemeine Electricitat and Felton-Guilleaume-Lahmeyer works are building, or have built, 60 large hoisting engines with a capacity of 40,000 tons of 8-hour shift, one-third of this capacity having been ordered by foreign collieries.

In the iron works electrical current has captured and transformed the methods of transportation, and to-day it is a question of driving the roll trains electrically. The electric motor is directly applicable to fly wheel trains and now builders are approaching the problem of driving reversing trains in the manner adopted for hoisting engines. Two of the large builders have built or have under construction 170 drives with a normal capacity of 100,000 horse-power. Among these there are five drives for reversing engines.

Direct driving with gas engines is considered only for large units, particularly for blowing engines, but also for roll trains, compressors and pumps. The blowing engines must be adapted to the peculiarities of the gas engine. They must be relieved during the start and the capacity must be lowered if they are to be used for high pressures. For driving roll trains, as yet not introduced frequently, the main point is to make the gas engine adequately powerful.

The development of the large unit gas engine has been extraordinarily rapid. In 1898 the first blast furnace gas engines were put into service, and to-day there are under construction and built for German iron works and collieries 125 gas blowing engines, with 156,000 horse-power, 175 gas dynamos with 193,000 horse-power, 11 gas engine roll drives with 17,000 horse-power, and 47 coke oven dynamos with 40,000 horse-power—a total of 358 gas engines with a capacity of 406,000 horse-power.

Two examples may be cited to indicate how far the waste gases suffice to cover power requirements. An iron works which produces on an average 300,000 tons of pig iron per annum, and has a corresponding allotment in making steel and rolled products, produces with waste gases in gas engines 25,000 horse-power. Its power requirements foot up to 20,000 horse-power. Under these circumstances very little energy would be available, for instance, for the manufacturer of steel by electricity.

A colliery in the Ruhr district which hoists 600,000 tons of coal per annum and cokes one-fourth of this output can produce from waste heat and from waste gases 3000 horse-power. Its requirements are about 2500 horse-power, but at times runs very much beyond this, so that here, too, the capacity is covered. There are quite a number of such normal works and collieries, but there are also blast furnace plants pure and simple independent of rolling mills pure and simple. Then, too, there are collieries which produce a good deal of coke and require little power, and other collieries which do not make any coke, but must handle a good deal of water from the mine. It is, therefore, a question of utilizing these differences. Thus the Gelsenkirchen, Hibernia and Rheinpreussen collieries have connected their shafts by electric cables and have current to spare for municipal purposes. The result is that in some instances the prices of current have declined so that some rolling mills have given up the practice of producing their own power and buy current in the open market.

The Derby Gas Company, Derby, Conn., has retained W. S. Barstow & Co., 56 Pine street, New York, as engineers in making extensive additions to its electric power plant and distributing system. The present plant will be remodeled to conform with the new installation, which will include some interesitng departures from current practice.

The Wabash Railroad at Pittsburgh, which recently secured trackage connections with the Homestead and Duquesne Steel Works of the Carnegie Steel Company, is now building a line to connect with the Clairton Works of that concern.

Canada's Steel Bounty at Low Point.

TORONTO, June 23, 1906.—With the beginning of July Canada's pig iron and crude steel bounties will enter upon their last stage (35 per cent. of their original rate) and upon the last year of the period for which their payment is at present authorized. That is to say, they shrink $1.05 a ton for pig iron and $1.05 a ton for steel that are the product of domestic ore; 70 cents a ton for pig iron and 70 cents a ton for steel that are the product of imported ore. With the last day of June, 1907, the bounties cease. There are also bounties on wire rods, on rolled angles, tees, channels, beams, joists, girders, bridge sections and structural forms generally, on flat eyebar blanks and on rolled plates not less than 30 inches in width and ¼ inch in thickness. In the case of the latter set of bounties their duration is not definitely limited by the law, but as Parliament may repeal the law enabling the Governor in Council to pay them they are as liable to sudden change as are the customs duties.

A Request from Steel Interests.

The blast furnace and crude steel interests of the country are not prepared to have the bounties on their products scaled down at the beginning of the next twelvemonth and wiped out at the end of it. President Plummer and Sales Agent Jones of the Dominion Iron & Steel Company waited on Premier Laurier a few days ago to lay before him considerations in favor of the retention of the pig iron and steel billet bounties at their present rate for another year. They represented that but for delays the company would have earned a much larger sum in bounties. By extending the period another year it would do no more than enable producers to make up for time unavoidably lost and would probably not cause the total outlay on bounty account to be larger than it would have been had no untoward circumstances hindered the full operation of works in the first year of the period.

As Parliament is still in session action may be taken in accordance with the petition. It is more probable, however, that the matter will be left over for the session to be called next November for the special business of revising the tariff. It may be the intention of the Government to drop bounties altogether and depend wholly on customs duties.

One thing that will tend to make the Government less tenacious of the bounty system is the increasing complexity of the protectionist problem to be solved. One of the new facts is the Atikokan Iron Company, in whose blast furnace at Port Arthur it is proposed to use ore from the Atikokan range in the Rainy River district. It is naturally in favor of a policy that would not put a premium on the use of Minnesota ore in the furnaces of Ontario rivals. A resolution recently introduced in Parliament declared for retaining the bounties, but solely for the benefit of production from Canadian ores. The discussion on it brought into sharp contrast this view and that of members who sympathize with the Cape Breton Company and with the company at Sault Ste. Marie, both of which are dependent on external sources of ore. It will not be easy for the Government to adapt its bounty law to both these interests. Moreover, there is a strong public opinion in Nova Scotia in favor of making the bounties of strictly Canadian application.

Recent Additional Aids.

A fact to be taken into the reckoning is that the steel industry is not now so dependent on its own resources as it was when the bounties on pig iron and billets were renewed in 1899. In the year of their second renewal by this Government (1903) a bounty of $6 a ton on wire rods, one of $3 per ton on structural steel, and one of $3 per ton on rolled plates were established. In the following year a rail duty of $7 per ton was adopted. In the latter year, also, the antidumping section of the tariff law was enacted. In 1904 the legislation providing for the construction of the National Transcontinental Railway was completed. This measure contains a clause inserted by the Government to insure that all rails imported for the construction of the road bear the duty specified in the Tariff act. These changes place the iron and steel industry of Canada in a position vastly more advantageous than that in which it was kept up to 1903. Up to the present all the rail contracts on the Government section of the National Transcontinental Railway have gone to the Canadian companies, as have the bulk of the orders for the Grand Trunk Pacific section and branch line. Nearly all the rails required within the last twelvemonth for the extensions, renewals and improvements of the Intercolonial, the Grand Trunk, the Canadian Pacific and the Canadian Northern have been purchased at Canadian mills. So far as the home rail output is concerned its present annual rate will have to be increased if it is to keep pace with the demand during the next three or four years.

In the House of Commons yesterday $9,000,000 of subsidy was revoted to aid the construction of several private company lines. The development of water powers is creating new demands for steel in electric railways and in structural work of all kinds. For all this trade the present tariff, irrespective of the bounties, gives the Canadian steel makers the preference. If they had a duty on wire and on some other products now largely imported they would doubtless be able to thrive without the bounties on the primary products.

Rerolling Rails.

A bill to amend the customs tariff in a few particulars is before Parliament. It provides, as is annually done, for the free entrance of beet root sugar machinery and alluvial gold mining machinery such as is not made in Canada, and also provides that steel rails sent from Canada to the United States to be rerolled may be admitted again on the payment of duty on the cost of the labor to which they have been subjected in the United States. In connection with the latter amendment it is stipulated that the duty on the full market value of the reimported rails may be imposed if at the time there is a mill in Canada in which rerolling could be done.

C. A. C. J.

The Railroads of the World.—A summary of the statistics of the railroads of the world, as compiled by the *Archiv für Eisenbahnwesen*, is summarized by the *Railroad Gazette*, indicating an increase of 16,751 miles, or 3.1 per cent., from 1903 to 1904, which is the largest addition reported for years, though but little more than in 1901. There has been an increase of 83,882 miles since 1898 and of 59,549 miles since 1900, making a total in 1904 of 550,735 miles, of which a little more than half is on the American continent, 44¾ per cent. in North America and 39 per cent. in the United States. The mileage in each of the grand divisions of the world was as follows: Europe, $189,774; North America, 249,717; Asia, 47,974; South America, 30,258; Africa, 16,202; Australasia, 16,810. About 95 per cent. of the European railroads have cost $20,017,888,000, or at the average rate of $112,777 per mile. The statistics for the rest of the world cover seven-eighths of the mileage, whose aggregate cost has been $17,463,250,000 and the average per mile $57,991. The average for the United States was $50,963. The total railroad investment of the world, providing the mileage not reported is of the average cost, was about $21,000,000,000 in Europe and likewise $21,000,000,000 in the rest of the world, less than $28 per inhabitant, according to the latest estimates of the population of the earth.

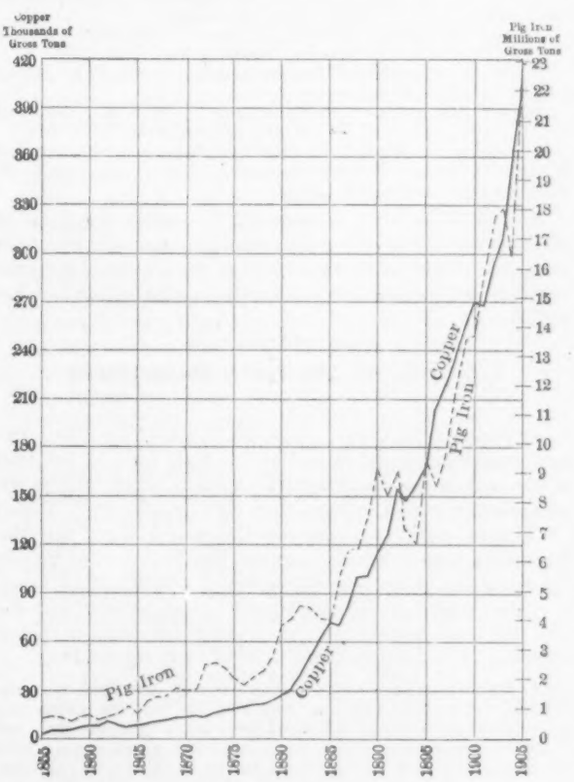
Manufacturing sites in and around Pittsburgh command a high figures. The Carnegie Steel Company has just released the site occupied by the Lower Union Works in that city, covering 20 acres, for 21 years, at a rental of $34,000 annually. The Denny estate, which owns the property, offered to sell it to the Carnegie Company for $2,000,000, but the lease was preferred. The old lease expires with the close of this year.

The Virginia Iron, Coal & Coke Company, Bristol, Tenn., which has built an addition to its plant, now has its new 12-inch rolling mill in operation and is making a full line of merchant bar iron. W. W. Crandall & Co., Nashville, Tenn., are general sales agents.

The Production of Pig Iron and Copper Compared.

The increase in the production of pig iron in the United States during the last decade has fulfilled with surprising accuracy the prediction made by Abram S. Hewitt 50 years ago. Copper production has similarly made wonderful strides, but it did not have the good fortune to gain the support of a prophet of equal international reputation. A comparison of the successively increasing production for the period covered by Mr. Hewitt's forecast shows how closely the output of the two metals has developed.

The production of these metals for the past 50 years is diagrammatically represented in the accompanying chart, in which 55 gross tons of pig iron occupies a vertical space equal to 1 gross ton of copper. The figures on the left represent the production of copper in thousands of gross tons, the value of the division being 30,000 tons, and the figures to the right represent the production of



Comparative Production of Pig Iron and Copper in 50 Years.

pig iron in millions of gross tons, the divisions marked on the vertical line each representing 1,000,000 tons. The production of pig iron is indicated by the dashed line, and that of copper by the solid one. The figures at the bottom of the chart mark five-year intervals, but the yearly production is indicated on the imaginary intervening lines. One of the most striking features of this diagram is the close proximity of the general direction of the two curves, representing the yearly production at the stated ratio of 55 to 1.

The upward course in the copper figures is marked by only four recessions, but these are all of comparatively small importance. The pig iron production, on the other hand, shows many breaks, the most conspicuous being from 1890 to 1896, the low point of 1894 being over 2,500,000 tons under the previous high record of 1890. The dip of 1904 is only conspicuous because of the rapid recovery of the following year.

The heavy line indicates that the copper production is much more even than pig iron, but it is interesting to note that a decrease in copper production follows one in pig iron by an interval of a year or two, showing that the supply is not so easily checked as that of iron. The marked stimulus given to its production after 1880 may be largely assigned to the increased production in Arizona and Montana. This table being computed from figures of production, one based upon consumption would show more irregularity, especially in the case of pig iron. During the earlier years imports would have had more effect, while during later years exports have been the larger. In some years of business depression in this country imports fell to low figures. In the copper trade during the earlier years there was considerable importation, but during the past few years exports have been a prominent factor, so that consumption has not maintained a ratio of 55 to 1 of pig iron.

The Bessemer Pig Iron Association.

For some years a majority of what are termed the merchant blast furnaces in the Mahoning and Shenango valleys has maintained an organization known as the Bessemer Pig Iron Association, of which Joseph G. Butler, Jr., the well-known pig iron manufacturer at Youngstown, Ohio, has been the efficient head. The functions of the organization consisted in selling the output of Bessemer and basic pig iron made by its members and at times it has directed concerted moves by which the blast furnaces it controlled would bank down for certain periods of time when an overstocked pig iron market made such restriction of output necessary. The organization also had the effect of steadying prices, both in serious pig iron depressions and also at times when a runaway market seemed inevitable because of an exorbitant demand for iron and a scarcity in supply.

The policy of the association has always been a conservative one and in various ways it has been productive of much good to its members. The monthly blast furnace reports, compiled and sent out by President Butler, have been a source of valuable information to the pig iron interests of the Central West by keeping them advised of the fluctuations in pig iron output. For several years the greater part of the Bessemer and basic pig iron made by the association furnaces has been sold to the Steel Corporation, the Republic Iron & Steel Company, Jones & Laughlin Steel Company and other smaller interests. A good part of the output was also sold to the Youngstown Sheet & Tube Company, which turned this iron over to the Republic Iron & Steel Company on a conversion basis, getting billets for it.

Until a few months ago the association controlled 16 blast furnaces in the two valleys, but about the first of the year several of its members became somewhat dissatisfied with the policy of the organization and withdrew. One or two others made contracts with an outside interest, agreeing to give their pig iron in exchange for ore and coke, and this resulted in the loss of seven stacks to the association, reducing its number of furnaces to nine. The completion of the new Bessemer steel plant now building by the Youngstown Sheet & Tube Company at Youngstown, which is expected to be in operation by September 1 next, will make further inroads into the membership of the association, or at least will very greatly reduce the tonnage of Bessemer iron the association will have to sell in the open market. Some of the leading stockholders in the Youngstown Sheet & Tube Company are owners of blast furnaces in the Mahoning Valley and have made contracts for a term of years by which their entire output of Bessemer pig will go to the new steel plant of the Youngstown Company. This arrangement will take from 1000 to 1200 tons of Bessemer iron per day out of the open market and represents considerably more than half of the Bessemer iron now controlled by the association.

Of the other five or six stacks that the association may still control, one stack runs exclusively on low phosphorus iron, another makes only foundry iron and a third makes washed metal used for special purposes. It would seem, therefore, that within a short time, and largely for causes over which it had no control, the Bessemer Pig Iron Association will cease to be the important factor that it once was in the Bessemer and basic pig iron trades in the Central West.

The American Engineers in Europe.

For the joint meeting of the Iron and Steel Institute and the American Institute of Mining Engineers, to be held in London from July 23 to August 4, and for the accompanying entertainment and excursions in Great Britain, the following programme has been provisionally arranged by the London Reception Committee:

Monday, July 23.—American visitors arrive and register at the office of Prof. Bennett H. Brough, secretary of the Iron and Steel Institute, 28 Victoria street, London, S. W.

Tuesday, July 24.—Morning: Session at the rooms of the Institution of Civil Engineers. Afternoon: Visit to Physical Laboratory, or to the Royal Mint, or reception at Armorers' and Braziers' Hall. Evening: Lord Mayor's reception at the Mansion House.

Wednesday, July 25.—Morning: Session. Afternoon: Visits to works of J. I. Thornycroft, I. & E. Hall (refrigerating machinery), or to the Temple and Inns of Court. Evening: Fête at Earl's Court Exhibition.

Thursday, July 26.—Morning: Session. Afternoon: Visits to works of Fraser & Chalmers, or other works, or reception at Ironmongers' Hall. Evening: Fireworks and supper at Crystal Palace.

Friday, July 27.—Morning and afternoon: Probably, excursion to Windsor. Evening: Institute banquet at the Guildhall.

Saturday, July 28.—Visit (*a*) to blast furnaces at Wellingborough, or (*b*) to Dover harbor and colliery.

The American visitors have been elected temporary members of the Whitehall, St. Stephen's and Royal Societies clubs. On Sunday, July 29, they will be invited to visit the Royal Botanic Gardens and the grounds of the Zoological Society.

Supplementary excursions are to be arranged as follows:

Monday, July 30.—American guests leave London for York—a party visiting Denaby Main Colliery on the way.

Tuesday, July 31.—Visit to Teeside, with alternative visits to works, and a public luncheon at 2 p.m. in Middlesbrough Town Hall. The ladies of the party will go from York to Fountain Abbey, Durham and Newcastle, where the party will spend the night.

Wednesday, August 1.—Visits to works and collieries at Newcastle and a conversazione in the evening.

Thursday, August 2.—To Glasgow via Carlisle, visiting Roman remains en route. The night will be spent at Glasgow.

Friday, August 3.—Excursion by rail and steamer. In the evening, reception in the City Chambers by the Lord Provost and Corporation of Glasgow.

Saturday, August 4.—Journey by special train from Glasgow to Edinburgh (with visits to the Forth Bridge, Rosslyn Chapel, Holyrood Palace and Edinburgh Castle. The tour will end here.

As an alternative tour, American visitors are invited to attend the meeting of the Institution of Mechanical Engineers, which begins at Cardiff, Wales, on Monday, July 30. The provisional programme of this meeting is as follows:

Monday, July 30.—Arrival at Cardiff.

Tuesday, July 31.—Morning: Reception by the Lord Mayor, &c., followed by session in the hall of the South Wales Institute of Engineers. Afternoon: After luncheon, visits to important works in and near Cardiff. Evening: Reception.

Wednesday, August 1.—Morning: Session. Afternoon: After luncheon, visits to works. Evening: Institute banquet at Park Hall, Cardiff.

Thursday, August 2.—Morning and afternoon: Visits to works.

Friday, August 3.—Excursions to places of interest in the districts of Cardiff, Barry and Newport, returning in the evening to Cardiff.

A special committee will provide for the entertainment of ladies during the meeting.

After the excursions in England and Wales a brief visit (in which a large number of members have signified their intention to participate) will be made to Germany, upon the invitation of the Association of German Ironmasters. The party will be received at Düsseldorf, Monday, August 13. The programme will occupy about four days. A subsequent excursion to Hanover and the Harz will be organized, if desired, and members will be assisted as far as possible in such further professional visits as they may individually desire to make. Full particulars of all these plans will be given to members upon their arrival and registration in London, July 23, or upon inquiry by letter, addressed to Dr. E. Schroedter, Association of German Ironmasters, Düsseldorf, Germany. The following is the provisional Düsseldorf programme:

Monday, August 13.—Arrival of guests and informal reception in the Park Hotel.

Tuesday, August 14.—Excursion by special steamer to various works on the Rhine, &c., with special side excursion for the ladies. Lunch and supper on the steamer, and an evening reception given in Düsseldorf by the Mayor.

Wednesday, August 15.—Excursion of the ladies to points of interest in Düsseldorf, and visits by the gentlemen to shaft No. 4 of the Rhenish-Prussian colliery, or the Phœnix and Rhenish steel works, or the Gutehoffnung smelting works.

Thursday, August 16.—General excursion to Vohwinkel, Elberfeld, Barmen, Tölleturm, Talsperre (where luncheon will be served), Remscheid and Solingen, returning to Düsseldorf in the evening. This trip will include not only fine scenery but also many interesting novelties, such as the one-rail elevated road, the electro-smelting at Lindenberg, &c.

Friday, August 17.—Excursion on the Rhine, by early train to Coblentz, and subsequent steamer trip up the river to St. Goar and back to Cologne.

The following papers will be presented at the London meeting on the part of the American Institute of Mining Engineers:

"Comparison of American and Foreign Rail Specifications, with a Proposed Standard Specification to Cover American Rails Rolled for Export," by Albert Ladd Colby, New York.

"Improvements in Iron and Steel," by James E. York, New York.

"Piping and Segregation in Steel Ingots," by Henry M. Howe, New York.

"Effects of Low Temperature on the Recovery of Steel from Overstrain," by E. J. McCaustland, Ithaca, N. Y.

"A Simple Distributer for Blast Furnace Charges," by David Baker, Philadelphia.

"A New Colorimeter for the Determination of Carbon in Steel," by Chas. H. White, Cambridge, Mass.

"The Gas Producer as an Auxiliary in Iron Blast Furnace Practice," by R. H. Lee, Liberty Furnace, Va.

"Internal Stresses and Strains in Iron and Steel," by Henry D. Hibbard, New York.

"Heat Treatment of Steels Containing 0.50 and 0.80 Per Cent. of Carbon," by C. E. Corson, Latrobe, Pa.

"Methods of Mining, Hauling and Screening Coal at the Mines of the Aldrich Mining Company, Brilliant, Ala.," by T. H. Aldrich, Jr., Birmingham, Ala.

In addition to the above list a considerable number of papers not relating to the subjects named have been accepted, to be read "by title," at the meeting, for subsequent publication. This list will be read at the London sessions.

Bar Iron for the Navy Department.

WASHINGTON, D. C., June 26, 1906.—The Navy Department is about to advertise for 1000 tons of bar iron to be used in the manufacture of chain cables and is desirous of securing competition for the contract, which for several years has gone to the only bidder, the Monongahela Iron & Steel Company, last year at the rate of 3.9 cents per pound, an aggregate of $87,360. The specifications, which have been issued by the department for the past five years, call for a very low percentage of sulphur. The requirements in detail are as follows:

1. The bars must be of homogeneous iron and must not contain more than 0.10 nor less than 0.03 per cent. of carbon nor more than 0.10 nor less than 0.04 per cent. of phosphorus. Nor shall the sum of the carbon and phosphorus be more than 0.15 per cent. The iron must not contain more than 0.01 per cent. of sulphur nor more than 0.10 per cent. of either silicon or manganese.

2. The bars must be of such length that they may be cut into bolts, of which 24 shall make a pile weighing 300 pounds, and 1 inch shall be added to the length of each bar over and above the foregoing requirements.

3. The bars shall be in cross section, about 1⅝ inches square, and shall be free from fag ends.

4. This iron, as received, must have a tensile strength of not less than 49,000 pounds per square inch nor more than 53,000 pounds per square inch, an elastic limit of about 60 per cent. of the breaking strain, an elongation of at least 30 per cent. in a length of 8 inches, and a contraction of area of at least 40 per cent.

5. Bolts cut from 1 per cent. of the bars rolled from this iron to 2½-inch round iron for cable making must stand bending cold until the sides are brought parallel, and separated from each other not more than ½ inch without showing signs of rupture. Such bolts must also have a tensile strength of not less than 48,000 pounds when rolled direct from 1⅝-inch square bar into a 2½-inch round bar. Bolts similarly rolled must also stand bending at red heat until the sides are close together without any signs of fracture. Such bolts as may be nicked and broken cold by slow bending must show fibrous.

6. One per cent. of the bolts rolled from this iron to chain sizes will be made into test specimens of three links, and this "triplet" must stand a pull of at least 37,500 pounds to the square inch of the sectional area of the link in a 2½-inch chain, and 41,000 pounds to the square inch of sectional area of the link in a 1¼-inch chain; in other sizes the breaking strain to be proportioned between these limits.

7. No bars showing evidence of cold rolling will be accepted.

8. Physical tests to be made at the Navy Yard, Boston, Mass., and all material, before acceptance, to be subject to inspection

and the right to reject any or all of the same that does not, in the opinion of the inspector, fulfill all requirements.

The department would not be averse to modifying these specifications if to do so would not involve any sacrifice in the quality of the iron or its suitability for the particular purpose for which it is desired. Any suggestions from responsible manufacturers will receive careful consideration. W. L. C.

Proposals for Battleships Michigan and South Carolina.

WASHINGTON, D. C., June 26, 1906.—The Secretary of the Navy opened bids on June 23 for the construction of the 16,000-ton battleships Michigan and South Carolina, authorized by the annual naval appropriation bill approved March 3, 1905. The proposals were submitted in two classes, those of class 1 being based upon the department's plans, while those of class 2 involve the use of bidder's plans, the majority of them embracing turbine engines. The lowest bid on the department's plans was submitted by the William Cramp & Sons Ship & Engine Building Company, which offered to build one of the vessels for $3,540,000. The next lowest bid on the department's plans was that of the New York Shipbuilding Company, which was $3,585,000. Should the department decide to build both vessels on its own plans the contracts will be allotted to the two companies mentioned. Other bids on the department's plans were those of the Newport News Shipbuilding & Dry Dock Company, $3,673,000, and the Union Iron Works, San Francisco, $4,250,000. Much interest attaches, however, to the bids in class 2, involving the use of bidder's plans, as it is possible that one ship with turbine engines may be ordered. The lowest bid in class 2 was that of the Fore River Shipbuilding Company, $3,689,000 for a vessel equipped with two 120-inch Curtis steam turbines, the weight of propelling machinery to be 1337 tons. The other bids in class 2 are as follows: New York Shipbuilding Company, with turbine engines, $3,900,000 and $3,850,000; Newport News Shipbuilding & Dry Dock Company, $3,813,000, $3,963,000, $3,753,000 and $3,713,000 (the last three bids provide for turbines); Fore River Shipbuilding Company (turbines), $3,945,000, $3,820,000, $3,719,000, $3,780,000; William Cramp & Sons Ship & Engine Building Company, $4,100,000.

Characteristics of Vessels.

The new battleships are to be 450 feet long and will have an extreme breadth at low water line of 80 feet 2⅝ inches. The mean draft at trial displacement is not to exceed 24 feet 6 inches. The coal bunker capacity of the ships will be 2200 tons each.

Each ship will have a main battery of 8 12-inch breech-loading rifles, and two submerged torpedo tubes. The secondary battery of each of the battleships will consist of 22 3-inch (14-pounder) rapid fire guns, 2 3-pounder semiautomatic guns, 8 1-pounder semiautomatic guns, 2 3-inch field pieces, four machine guns of caliber 0.30.

The hulls of the new battleships are to be protected by a water line belt 8 feet wide, varying in thickness from 8 to 12 inches. This armor will be tapered in sections, being thicker above the water line. Complete belts of cellulose will encircle the ship to automatically close up holes made by shot below the water level.

The engines will be of the vertical, twin screw, four cylinder, triple expansion type, of a combined indicated horse-power of 16,500, and arranged for outboard turning propellers when going ahead. The steam pressure will be 265 pounds in the high pressure valve chest.

There will be 12 water tube boilers, fitted with superheaters, placed in three water tight compartments. The type of boiler will be as approved by the Bureau of Steam Engineering. There will be 1050 square feet of grate and not less than 46,750 square feet of heating surface, of which 4675 square feet will be superheater. The working pressure will be 295 pounds. The length of grates will be about 6 feet 9 inches. The steaming capacity will be such that all steam machinery on board can be run at full power with an average air pressure in the firerooms of not more than 2 inches of water. All parts of the boilers subject to pressure will be of wrought steel. There will be two smoke pipes, each 100 feet high above the base line.

The following auxiliary steam machinery of approved make and design, in addition to that pertaining to the main engines and dependencies, is to be supplied by the contractor and installed complete with all piping and fittings: Steering engine, windlass engine, ash hoist engines for each fireroom, evaporating plant, to consist of not less than three units, having a total capacity of 16,500 gallons of fresh water per day; a distilling apparatus capable of condensing at least 16,500 gallons of water per day, dynamo condensers and an air compressor plant.

Machine shop Equipment.

The following machine tools, of approved make and design, will be furnished and installed by the contractor in the general workshop, the tools to be run by electric motor or motors:

One screw cutting, back geared, extension gap lathe, to swing 28 inches over the upper ways and 48 inches over the lower ways, and to take between centers 10 feet when extended; one 15-inch screw cutting, back geared lathe, to take not less than 4 feet between centers; one column shaping machine of about 15-inch stroke and not less than 15-inch traverse; one upright drill to drill up to 1½ inches in steel, 14 inches from edge of work, with at least 14-inch traverse of spindle; one 16-inch sensitive drill; one universal milling machine, with at least 18-inch table feed, 4½-inch traverse and 13-inch vertical feed; one combined hand punch and shear, with 6-inch shear blades, to cut ¾-inch round iron, shear ⅜-inch steel plate, and punch ⅜-inch holes in ⅜-inch mild steel plates 4 inches from edge; one emery grinder on column, with two carborundum wheels 12 inches in diameter and 2-inch face; one portable cylinder boring machine, to bore from 6 to 24 inches and to have at least 30-inch stroke; six-bench vises; one anvil; one blacksmith forge in blacksmith space; one portable forge, and all necessary and usual spare parts, tools, &c., will be furnished for the above mentioned machine tools. W. L. C.

The Production and Importation of Precious Stones.—The production of precious stones in the United States during 1905 amounted to $326,350, according to the annual report of Geo. F. Kunz of the United States Geological Survey, shortly to be issued. The gems, the production of which exceeded $5000, were, in the order of their value: Sapphires, turquoise, tourmalines, peridots, crystal quartzes, aquamarines, kunsite, gold quartz chrysoprase, silicified wood and garnets. Southern California now leads in the production of tourmaline, beryl and topaz, instead of, as formerly, the Ural Mountains, while its increased production of turquoise is making up for the decreased production in New Mexico and Arizona. The importation of precious stones during the same year amounted in value to $34,998,518, or nearly $9,000,000 more than in the preceding year. This included $10,281,111 worth of uncut diamonds, the large and increasing import of which accounts for the growth of the lapidary industry here. Many skilled diamond cutters have come from Holland to this country, and especially New York City, where to-day some of the most difficult kinds of lapidary work are being successfully done.

A torpedo signal device is being experimented with by the Chicago, Milwaukee & St. Paul Railroad, intended to augment or replace the usual visual block signal. The device automatically places a torpedo on the track when there is danger ahead, and this is exploded as the train enters the block, warning the engineer, even if he fails for, any reason to heed the signal lights. The inventor is R. J. Zorge.

Some extensive improvements and additions will be made to the Lower mills of the Carnegie Steel Company at Youngstown, Ohio. The plant will be thoroughly remodeled, and a complete Belgian mill will be installed. A new 8-inch mill was added to this plant some time ago.

The New Trademark Regulations.

WASHINGTON, D. C., June 26, 1906.—The Commissioner of Patents has completed a revision of the trademark regulations to conform to the requirements of the Currier trademark act, approved by the President May 4, 1906, and which will go into force July 1. This act obviates the necessity for a verbal description of a trademark in the application; authorizes the Commissioner of Patents to establish classes of merchandise for the purpose of trademark registration; and prescribes new requirements for the registration of trademarks by foreigners. Under the second provision of the bill the Commissioner has already promulgated a classification of merchandise, the text of which recently appeared in these columns.

Requirements as to Foreigners.

In revising the trademark regulations, the Commissioner has stricken out rule 17 with regard to the requirements for the registration of trademarks owned by foreigners and has substituted two new sections as follows:

17. Except as provided by section 2 of the act of May 4, 1906, no trademark will be registered to an applicant residing or located in a foreign country unless such country, by treaty, convention or law affords similar privileges to the citizens of the United States, nor unless the trademark has been registered by the applicant in the foreign country in which he resides or is located, nor until such applicant has filed in this office a certified copy of the certificate of registration of his trademark in the country where he resides or is located. Such certified copy must be duly authenticated by the certificate of a diplomatic or consular officer of the United States. In such cases it is not necessary to state, in the application, that the trademark has been used in commerce with the United States or among the several States thereof.

18. The owner of a trademark, residing or located in a foreign country, who shall have a manufacturing establishment within the territory of the United States, may register a trademark used on the products of such establishment upon complying with the provisions of the act of February 20, 1905, as prescribed for owners of trademarks domiciled within the territory of the United States.

Section 2 of the act of May 4, 1906, referred to above, permits an applicant to register upon a single application a trademark for any or all goods upon which the mark has actually been used, and in cases where a mark has already been registered for one article its use may be extended without specific compliance with the provisions of the new rule.

Nonregistrable Marks.

Rule 18 of the old code has been renumbered as 19, and amended to meet the requirements of the new law, with regard to the registration of trademarks upon the application of American citizens, foreigners and nonresidents as follows:

19. No trademark will be registered to an owner domiciled within the territory of the United States unless it shall be made to appear that the same is used as such by said owner in commerce among the several States, or between the United States and some foreign nation or Indian tribe; no trademark, except as provided by section 2 of the act of May 4, 1906, will be registered to an owner residing in or located in a foreign country unless said country, by treaty, convention or law, affords similar privileges to the citizens of the United States; no trademark will be registered which consists of or comprises immoral or scandalous matter, or which consists of or comprises the flag or coat of arms or other insignia of the United States or any simulation thereof, or of any State or municipality, or of any foreign nation, or which is identical with a registered or known trademark owned and in use by another, and appropriated to merchandise of the same descriptive properties, or which so nearly resembles a registered or known trademark owned and in use by another, and appropriated to merchandise of the same descriptive properties, as to be likely to cause confusion or mistake in the mind of the public, or to deceive purchasers; or which consists merely in the name of an individual, firm, corporation or association, not written, printed, impressed or woven in some particular or distinctive manner or in association with a portrait of the individual or merely in words or devices which are descriptive of the goods with which they are used, or of the character or quality of such goods, or merely a geographical name or term; no portrait of a living individual will be registered as a trademark, except by the consent of such individual, evidenced by an instrument in writing; and no trademark will be registered which is used in unlawful business, or upon any article injurious in itself, or which has been used with the design of deceiving the public in the purchase of merchandise, or which has been abandoned.

Form of Application.

The changes in the new law, with respect to the form of application and especially the elimination of the requirement of a verbal description of a trademark, have made it necessary to amend paragraphs *b* and *c* of rule 21 of the existing code, which now appear as rule 22, in the following form:

b. A statement specifying the name, domicile, location and citizenship of the party applying; the class of merchandise, and the particular description of goods comprised in such class, to which the trademark is appropriated; a description of the trademark itself only when needed to express colors not shown in the drawing; and a statement of the mode in which the same is applied and affixed to the goods, and of the length of time during which the trademark has been used, and, if the applicant be a corporation or association, it must be set forth under the laws of what State or nation organized.

c. A declaration complying with section 2 of the act of February 20, 1905.

Heretofore, rule 23 has provided that the name of the applicant, wherever it occurs in the papers in the case, must agree with the signature to the formal application and will so appear in the certificate of registration. Owing to the fact that applicants have not observed this rule closely, the Commissioner now proposes to authorize the officials of the bureau to amend all papers to meet this requirement. This section of the regulations has, therefore, been revised and renumbered as rule 24 to read as follows:

24. The name of the applicant will appear in the certificate of registration precisely as it is signed to the statement of the application, and, therefore, the signature to the statement must be the correct signature of the applicant, and the name of the applicant, wherever it appears in the papers of the application, will be made to agree with the name as signed to the statement

In compliance with the classification feature of the new law the Commissioner has inserted a new section in the regulations, to be known as rule 30, as follows:

30. A trademark may, at the option of the applicant, be registered on a single application, for any or all goods comprised in a single class of merchandise, provided the particular description of goods be stated, and provided that the mark has been actually used upon all of the goods specified.

Rule 29 of the old code, has been revised not only to meet the requirements of the Currier law with regard to the form of the application, but also to embrace a verification of the facts set forth in the applicant's statement. Renumbered as rule 31, it provides as follows:

31. The application must be accompanied by a written declaration, verified by the applicant, or by a member of the firm, or by an officer of the corporation or association applying, to the effect that he believes himself, or the firm, corporation or association in whose behalf he makes the declaration, to be the owner of the trademark sought to be registered, and that no other person, firm, corporation or association, to the best of his knowledge and belief, has the right to use the trademark, either in the identical form or any such near resemblance thereto as might be calculated to deceive; that such trademark is used in commerce among the several States, or with foreign nations, or with Indian tribes; that the drawing truly represents the trademark sought to be registered; that the specimens (or *facsimiles*) show the mark as actually used upon the goods; and that the facts set forth in the statement are true.

Foreign Owned Factories.

The requirements of section 3 of the Currier act regarding the applications of foreigners having manufacturing establishments within the territory of the United States, have made it necessary to revise rule 31, which, renumbered as rule 33, provides as follows:

33. If the applicant resides or is located in a foreign country, the declaration required, unless the application is presented under the provisions of section 2 of the act of May 4, 1906, shall also set forth that the trademark has been registered by the applicant, or that an application for the registration thereof has been filed by him in the foreign country in which he resides or is located, and shall give the date of such registration, or of the application therefor, as the case may be. In such cases it shall not be necessary to state that the mark has been used in commerce with the United States or among the States thereof.

If the application is presented under the provisions of said section 2 of the act of May 4, 1906, the declaration, in addition to the requirement of Rule 31, must state that the applicant has a manufacturing establishment within the territory of the United States and that the goods upon which the trademark is used are the product of such establishment.

The new regulations take effect coincidently with the Currier tradmark law, which goes into force on July 1.

Customs Officials Notified.

In this connection the Secretary of the Treasury has called the attention of collectors of customs to the provisions of Section 3 of the Currier act, the text of which is as follows:

Sec. 3. That any owner of a trademark who shall have a manufacturing establishment within the territory of the United States shall be accorded, so far as the registration and protection of trademarks used on the products of such establishment are concerned, the same rights and privileges that are accorded to owners of trademarks domiciled within the territory of the United States by the act entitled "An act to authorize the registration of trademarks used in commerce with foreign nations or among the several States or with Indian tribes, and to protect the same," approved February 20, 1905.

In the administration of this section, collectors of customs are notified that the department "has ruled that affidavits accompanying applications for recording the names of foreign manufactures, manufacturers, or traders (not registered as trademarks in the Patent Office) may be certified by American consular officers."

W. L. C.

Pennsylvania Factory Inspection.

HARRISBURG, PA., June 26, 1906.—The following are salient facts of interest to the iron, steel and machinery trades in the annual report of the chief factory inspector of Pennsylvania:

"The number of establishments inspected during the year ended December 31, 1905, was 14,642. The number inspected during the year prior was 16,589. This apparent decrease is attributable to the change in the law relating to the inspection of workshops commonly called 'sweat shops,' by which change about 2880 family workers in 2880 dwelling houses were properly placed under the sole jurisdiction of the local boards of health.

Accident Statistics.

"The number of fatal accidents for the year 1905 was 162 and the number of nonfatal was 923. Moving cranes and their appendages caused the death of 90 and injuries to 110. Unguarded machinery caused the death of 26 and serious and slight injuries to 701. The serious injuries for the most part consisted of the loss of finger joints upon machines worked by foot power and always under the control of the operatives. As yet no plan has been devised by which these machines can be properly guarded without destroying their effectiveness, although the department has solicited the services of skilled mechanics and has been aided by the owners of such machinery. By jumping upon elevators in motion ten persons were killed and 49 injured. One person was killed by falling down an open elevator shaft. By contact with circular saws four persons were killed and 57 injured, these accidents being the result in nearly every instance of employees removing the safety guards. In the adjustment of belting upon wheels and shafting without shutting off the power 26 were killed and 52 injured. In but three of these accidents were the belts unguarded, the injured parties in all other cases being wholly responsible for the accident which befell them. A bursting fly wheel caused the death of four persons and injuries to a like number. A bursting saw killed one person and a bursting emery wheel killed one and injured four other employees.

"Since the enactment of the act of May 2, 1905, a vigorous and persistent warfare has been waged against projecting set screws, a fruitful source of many deaths and painful injuries. In the guarding of cogs, wheels, belts, &c., 1008 orders were issued, of which orders 786 were complied with, and efforts are being made to secure safety appliances in all cases. To guard belts, set screws and machinery in general requires nothing more than a will to do so and the expenditure of a little money. But there are some machines to safeguard which and at the same time not render their productive power nugatory will require the skill of an inventive genius at present unknown. The almost uniform disposition of those in charge of industrial power using establishments is to safeguard belts, shafting and machinery, but there are some who have shown a disposition to do nothing except under compulsion.

Other Accidents.

"It should be understood, however, that the accidents above mentioned are such only as come within the jurisdiction of this department to prevent, if possible. Besides these numerous accidents, some of the most shocking in character have occurred—how many it is not possible to state, but the number is probably not less than 2000 each year. Beneath the roofs of iron mills and furnaces and in the yards appurtenant thereto the slaughter of employees is a matter of daily occurrence. In some of the largest of these mills the temporary morgue seems to be as necessary a part of the establishment as the stock house or the business office, and human life in and about such establishments would appear to be the cheapest of all raw materials. The stockholders who know these establishments as things producing dividends; the manager who shifts responsibility upon the superintendent; the superintendent who gives orders to the foreman, and the foreman to some petty bosses—are each and all apparently imbued with but the single idea of having the work pushed and rushed to the extreme limit of human endurance. An explosion of gas, a slipping of the furnace, a cave-in of a furnace stack, a tilted ladle, a cracked converter, the overturning of a pile of iron, the breaking of a rotten scaffold, the onrush of the unguarded and signalless crane, the backing of engines and cars without flagmen or bellmen—these are some of the most common of death dealing agencies which make human life in and about iron mills as precarious as upon a field of battle.

"Where this department has jurisdiction in the safeguarding of machinery, elevators, fly wheels, boilers, pits, vats, &c., great good has resulted to the employees, many accidents, fatal and otherwise, once so common, being of rare occurrence, and then only when the deputy inspectors had failed to perform their duties or where the safeguard had been taken off by the parties injured.

Boilers.

"In the act of May 2, 1905, section 19, which compels the inspection of steam boilers by casualty companies or other competent parties approved by the chief factory inspector, has been fruitful in good results. From the time the act went into operation until the close of the year, inspections of boilers by casualty companies, and in few instances by persons approved by me, numbered in all 479. These inspections were of additional value because the firms making the inspections had practically indorsed their reports by issuing insurance policies upon the boilers. Prior to the passage of the act aforesaid boiler inspections, except in large establishments, were not of a character that would insure safety to the boilers or to those employed near to them.

"Under the present law it is mandatory that steam boilers be insured without an order to that effect being first issued by this department. This leaves a justly wide open door for the collection of damages where injuries occur from explosions of boilers not properly inspected. It also enables some of the deputy factory inspectors to attend to business of more importance and of less expense than that of hunting up boilers in sawmills and dairies located in out of the way places."

The master roofers of the Pittsburgh district have formed an association, to be known as the Master Slate and Roofers' Association of Allegheny County. A charter has been applied for, to be acted upon at the July term of court. The specific objects for which it asks incorporation are union for beneficial and protective purposes and the avoiding and adjusting of trade controversies between its members and their employees.

The B. F. Sturtevant Company, Hyde Park, Mass., states that there is absolutely no truth in the statement, widely circulated in the daily press, that it has granted a 50-hour week, with no loss of pay, to its employees. The company has been operating on a 54-hour week for several years, and will continue to do so.

The Berkshire Molding Machine.

One of the interesting exhibits at the recent annual convention of the American Foundrymen's Association at Cleveland, Ohio, was that of the molding machine built by the Berkshire Mfg. Company, Cleveland, Ohio, two of which were shown in operation. The most essential feature of this machine is that it is entirely automatic and does all of the work of molding and not only one or two parts of it. All that is necessary for the operator to do is to place the flask and bottom board in position, throw the operating lever and in seven seconds the one-half mold is complete. The machine puts the sand in the flask, rams it, vibrates the pattern and removes the pattern from the sand. Another important feature of the machine is that it is very heavily constructed and cannot easily be broken, even by careless use. The belt driving the machine is a safety link in its operation, for if the operator puts a flask or board in wrong nothing more serious than the slipping of the belt can result.

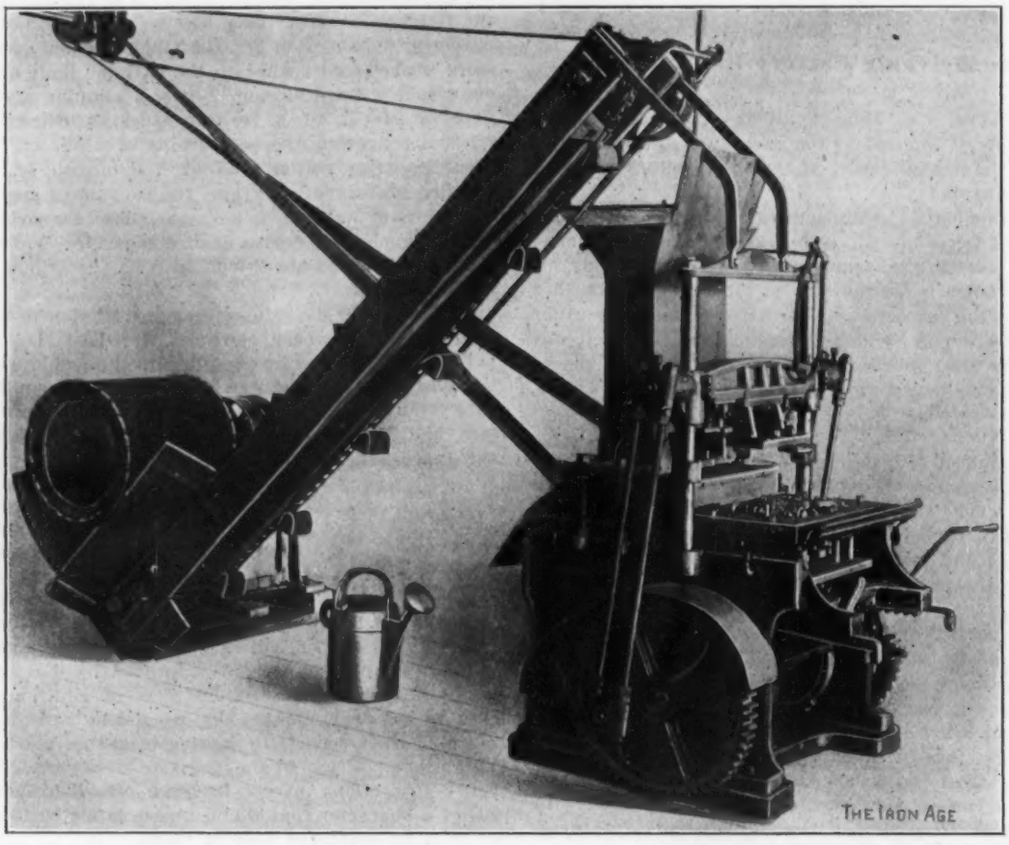
The accompanying illustration shows an equipment complete, comprising the molding machine, a sand sifter and a bucket elevator for conveying the sand from the sifter to the hopper above the machine. The machine automatically carries the flask to the rear, where it is filled with sand. It then travels forward and in its course is met by the bottom board, supported from the ram, which is forced down, ramming the sand. The vibrator is immediately thrown into action, and at the same time lifting pins raise the flask off the pattern. While the flask goes back to receive its charge of sand the bottom board is supported by suitable hooks, but as the ram comes down these hooks are drawn back so that the board remains upon the mold. The operator has simply to raise the flask off and set it to one side, blow the sand from the table by means of the air hose, and the machine is ready for placing the other half of the flask and making the other half of the mold.

Time may be economized by placing the second half of the flask upon the machine and starting it before taking the completed half of the mold to the floor. By the time the latter is accomplished the second half has been finished by the machine and is ready to be lifted off and carried to the floor. When using snap flasks and making light molds the mold may be assembled on a bench beside the machine and only one trip to the floor made. In this case the molder can have two sets of flasks and arrange it so that the machine is ramming the drag for the second mold while he is carrying the first to the floor.

When making the cope the machine is so arranged that it cuts the sprue. In fact, the machine does all of the work after the flask and board are placed in position and the operating lever is started.

The pressure with which the ram presses the sand can be easily adjusted, and as the flasks are filled automatically all are sure to be rammed alike. It is also possible to adjust the boards in a way to cause the drag to be rammed harder than the cope, when that is desirable.

An interesting provision is that for heating the pattern plates by gas jets from beneath, so that the molds will draw readily without the use of any parting material. By employing the proper grade of molding sand very fine work can be made in this way without any facing, and by avoiding the introduction of parting sand the life of the molding sand is greatly increased.



A Complete Molding Machine Equipment, Including Bucket Elevator and Sand Sifter, as Built by the Berkshire Mfg. Company, Cleveland, Ohio.

Reports from British iron markets indicate that in the week of June 15 a reaction from the uncertain condition of the few weeks preceding was noticed and considerable activity appeared. Middlesbrough No. 3 foundry iron advanced 1s., to 51s. 9d. The rail trade showed good demand, with prices at £6 7s. 6d. Another factor of promise was the report that Russia would place large shipbuilding contracts in Great Britain.

It is reported that the Western Electric Company, New York, contemplates the erection of a plant to draw copper wire.

Foundry Tests of Coke.

At the convention of the American Foundrymen's Association in Cleveland, June 6, the secretary, Dr. Richard Moldenke, presented a report of the work so far done by the association's committee appointed at the Indianapolis convention in 1904 to carry on tests of coke made in the fuel testing plant of the Government on the St. Louis Exposition grounds. The committee consisted of H. E. Field of Pittsburgh, W. J. Fogarty of St. Louis and R. Moldenke. The coke was made in connection with the tests of the Government on the miscellaneous coals sent from all over the country. Whenever a coal would coke and showed some promise of being useful for the foundry it was kept for these tests. In this way 19 tests were made, and at present some 140 more await trial.

Details of Test Methods.

Two small cupolas were used and uniform conditions were maintained relative to iron, scrap, charging, &c. The melting ratio was 1 to 7 and the blast was 7 ounces. Tests were made consecutively and weather conditions remained identical. The records kept were as follows: Identification of sample. Charge in detail. Time of putting on blast. Time of first iron. Time and weight of every ladle of iron. Melting rate per hour. Temperature of iron as measured by fluidity strips. Melting loss. Analysis and characteristics of coke. Characteristics of test and conclusions derived therefrom. The metal used in each test comprised 3000 pounds of iron, 2250 pounds being pig iron and 750 pounds scrap, made in the tests and of uniform size and weight. The coke was 430 pounds. The proportions of the charge varied from test to test, according to the density of the coke taken. For purposes of comparison tests were also made with standard cokes during the series, so that there might be no question as to the practicability of the system employed. After detailing the above and other conditions of the tests the report gives some of the results, as follows:

The Results.

The results of the tests are published by the United States Geological Survey and will interest the owners of the coal more than the general foundry public. Much of interest can, however, be extracted by us and applied to our daily operations. Thus, in the very first test, on a rather light coke, the bed was burned away so rapidly that the melting zone came down far enough to allow a direct burning of the iron. Great quantities of slag were formed, the slag spout could not take it away, the tuyeres were filled up and bottom had to be dropped. On weighing up the material next morning it was found that over half of the iron had actually burned up and passed into the slag. The melting loss was 52.5 per cent. This is a commentary on what occurs daily in our foundries. No matter how carefully the melting operations in the cupola may be conducted there will always be more or less burning of small particles of the metal as it drops down through the bed. Unfortunately not all of this oxidized metal passes off into the slag, but dissolves in the melted iron; hence weak castings. In the case above mentioned the coke was plainly at fault, though other cupola arrangements might have saved much of the iron. The moral of the story, however, lies in the necessity for watching carefully whether the practice in the arrangement of the coke charges, blast, &c., is such that only a minimum of this burning takes place.

Taking the melting loss of all of the heats made we find that the minimum was 3.2 per cent., made on a coke very close in resemblance to the Connellsville product, but lighter. The three standard cokes gave a melting loss of 6.8, 8.2 and 10.3 per cent., which is high, and due to the smallness of the heat and comparatively hard iron used. The average of the good cokes tested was 10 per cent., while the bad cokes ran up to 25 per cent.

Time Required to Get Iron.

Another interesting point was to note the time it took to get the first iron. It took 5 up to 15 minutes after the blast was put on. Where the iron came quickly and the coke was of good composition excellent foundry results were obtained, the charges evidently having been suitable. The coke taking 15 minutes for the first metal to appear was an exceedingly heavy coke, and the bed had to burn down to the proper point before the pig was melted. The result naturally was that the upper charges of coke were comparatively too small, as too much went into the first bed and the heat could not be completed. The coke had 15 per cent. ash, making its use problematical in the foundry. The lesson for us to learn from this test would seem to lie in watching how quickly iron shows at the spout, if the tap hole is kept open, in order to note whether the coke bed is too thick or not. There is no economy in putting on an extra heavy bed of coke, in order to have to wait until it is burned down low enough to let the iron get to the melting zone.

A number of other little points might be mentioned, but the above will be sufficient to show that these tests are not only valuable in determining the utility of coals other than the standard coking ones for making foundry coke, but also in giving an opportunity to run through the cupola a lot of material the ordinary foundryman would not look at, and getting the experience this brings without ruining castings.

New Publication.

Eminent Engineers.—Brief biographies of 32 of the inventors and engineers who did most to further mechanical progress, by Dwight Goddard, Mem. Am. Soc. M. E. Publisher, the Derry-Collard Company, New York. Size, 5½ x 7¾ inches; pages, 280. Illustrated. Price, $1.50.

This exceedingly interesting collection of short biographies originally appeared in monthly numbers issued from 1903 to 1906 by Wyman & Gordon, manufacturers of drop forgings, Worcester, Mass., and Cleveland, Ohio. Some of them have been entirely rewritten, others have been enlarged and revised, and others left as originally written. In his choice of subjects the author has selected those who have accomplished something of importance in the development and application of power and machinery, and for convenience the work is divided into two parts, European and American. Among the American biographies are included those of Benjamin Franklin, John Fitch, Nathan Reed, Oliver Evans, Robert Fulton, John Stevens, Robert L. Stevens, Eli Whitney, Thomas Blanchard, Elias Howe, John Ericsson, Peter Cooper, George H. Corliss, Alexander L. Holley, William R. Jones and James B. Eads. The Europeans include Richard Arkwright, Thomas Newcomen, James Watt, Matthew Boulton, William Murdock, William Symington, Richard Trevithick, Henry Maudsley, George Stephenson, I. K. Brunel, James Nasmyth, Alfried Krupp, Charles Babbage, Sir Joseph Whitworth, Sir Henry Bessemer and Sir William Siemens. The author has a pleasing style and has made the book quite as entertaining as a work of fiction, but it has the advantage over fiction that it is all true to the best of the author's knowledge. It is, therefore, instructive as well as entertaining, and its reading is a pleasant and profitable pastime. Mr. Goddard has spent a large amount of time collecting and assorting the material from which the description has been taken, and has retained only that calculated to be of general interest. Many of the portraits are rare and were obtained from interesting sources, giving to the book a peculiar value to those who are interested in the history of mechanical progress.

Of the molders who struck on May 1 at the foundry of the Whiting Foundry Equipment Company, Harvey, Ill., 16 have returned to work without any agreement by the company to recognize the union.

For the making of additional improvements at its plant at Pottsville, Pa., the Eastern Steel Company has voted to increase its funded indebtedness from $2,500,000 to $3,000,000.

THE IRON AGE

1855—1906.

New York, Thursday, June 28, 1906.

DAVID WILLIAMS COMPANY, ... PUBLISHER
CHARLES KIRCHHOFF, ... } EDITORS
GEO. W. COPE, ... }
A. I. FINDLEY, ... }
RICHARD R. WILLIAMS, ... HARDWARE EDITOR

A Longer Life for Steel.

The meeting of the American Society for Testing Materials at Atlantic City last week emphasized the growing urgency of the demands upon steel manufacturers. Two phases of the steel problem received attention—the causes and the prevention of corrosion of structural steel and the steps to be taken to prevent failures of steel rails in service. The questions are not new, and it cannot be said that the discussions at last week's meeting added greatly to the information already available. Particularly is this true as to steel rails. Of special significance was the decision to create a permanent Committee on the Corrosion of Iron and Steel. Judging from the society's work in other important lines and the magnitude of the interests at stake, it may be expected that a distinct gain will come from the investigations thus to be undertaken. In a day when endowments are common one could scarcely suggest a work upon which money could be spent with larger return to metallurgical science and directly to the entire steel using world than on experiments looking to the prolongation of the life of steel in service. The boasted successes of engineers and manufacturers in any line of by-product recovery would look small beside a discovery which should make it possible to stop even measurably the prodigious corrosion of iron and steel under modern conditions.

Every discussion on methods of protecting iron and steel surfaces against corrosion comes back to the seeds of destruction introduced into the metal in its manufacture. The problem of the steel maker is admittedly greater than that of the paint maker. The suggestion made at the Atlantic City meeting that the substance may yet be found which, added to the steel in the furnace or converter, will greatly increase its resistance to corrosion may not appear entirely novel, in view of what has been done with nickel and other additions. But the problem is to find a cheap element or process which shall serve that purpose. It is of interest to know that in connection with the manufacture of steel tubing experiments have already been carried to a point at which the manufacturers feel confident of securing longer life of the steel without adding to the cost to the consumer.

The familiar comparisons between iron and steel in their liability to corrosion were gone over again in this last discussion, and in this connection heed may well be given to the suggestion by Professor Howe that what is needed for the gathering of data of real reliability is the carrying of tests to the point of destruction of the metal. Moreover, service tests rather than laboratory tests will best determine whether the popular expressions as to the relative life of iron and steel are well founded. There has been an abundance of popular testimony on the subject, but relatively meager data of scientific value.

One thing often overlooked is the response the steel manufacturer has steadily made to the demands upon him. He has not only marvelously cheapened his product in the past 20 years, but he has met a demand for quantity that was never dreamed of in the days of the vogue of iron. Moreover, little as the fact seems to be appreciated in some of the loose talk about the unsatisfactory life of steel, the manufacturer has steadily improved the quality of his product. There is still defective steel and always will be, but the good steel of to-day is better than the accepted steel of 20 years ago. The steel manufacturer is now asked to add to his successes by furnishing an antidote for the diseases growing out of more recent conditions of service. He seems to be held responsible in some quarters for the sulphur laden atmosphere of the modern city and for the increasing destruction due to electrolytic action.

The work to be undertaken by the American Society for Testing Materials in investigating the corrosion of iron and steel will not be a matter of one year or two years, but of many years. Having the pick of the testing engineering talent of the country in its membership, from both experimental laboratories and steel works, the society attacks the problem with some confidence. Large commercial interests are also allied with it in a way that should afford all facilities for exhaustive research. The results may well prove one of the most important developments in latter-day engineering.

A Changed Policy in Selling Repair Parts.

Many manufacturers of machinery have made a complete change in recent years in their policy of supplying customers with repair parts and in doing repair work. Formerly it was the general practice to charge a stiff price for this class of business. Now the tendency is to put the price as close to cost as possible. It is considered better business to do so. In the machine tool trade the practice is based on the theory that a machine should endure in all its parts, though no one can seriously maintain that any machine is expected to last until it shall go to pieces all at once, like the one-horse shay.

Of course there is no sentiment in this matter. Manufacturers consider that customers are more apt to give other orders where they are best treated. Yet it is sometimes difficult to convince a buyer that he is not being overcharged when he has repair work to be done. Certain parts of standard machine tools can be quickly and cheaply replaced, provided the particular type of machine is still being manufactured. Usually, however, it is not the new tool that gives out, but one which the maker no longer builds. He must make the part as a special order in his shop. It may be a casting, for which a new pattern must be made. The bill in such an instance must of necessity be large and the customer complains. In fact the machine tool builder sometimes does not get his money back. He may make up the exact cost of the part in labor and materials and its share in general expense and yet he has not included all the real cost to him, for one special piece of work in a highly organized machine shop means the upsetting of the routine of production. In times such as these the bane of the shop is a piece of work which does not fit in with the scheme of producing the maximum of work. Yet the machine tool builder and other manufacturers of machinery and equipment will give the customer a bill at actual cost, reckoned without profit or indirect cost.

The policy of making large profits on repair work is never a good one. A fair profit would be perfectly justifiable on this, as on any other part of manufacturing. But to overcharge because the customer is in the manufacturer's or dealer's power does not pay. In their anxiety to avoid the suspicion of such methods some manu-

facturers cut prices so low that the National Machine Tool Builders' Association once took up this matter, members complaining that repair work was becoming an expense. Perhaps the swing from old time practice has been extreme.

International Trade in Iron and Steel.

Both imports and exports of the three leading iron countries—the United States, Great Britain and Germany—have shown a great increase in the first four or five months of this year over the corresponding months of last year. With the United States, at least, it has been more often the case that where imports rose exports fell and *vice versa*. This would appear to be the natural movement, the swing in one direction or the other being due to greater or less demand at home. Figures for this year, so far as officially reported, compared with those for similar periods last year are summarized below in tons. The classification is different for each country, but that does not affect comparisons. In general the totals include pig iron, semifinished steel and finished material, but they do not include ore or machinery:

United States (Four Months).—Gross Tons.

Exports,	1906	474,031
	1905	319,612
	Increase	154,419
Imports,	1906	165,429
	1905	98,115
	Increase	67,314

Germany (Four Months).—Metric Tons.

Exports,	1906	1,214,109
	1905	962,926
	Increase	251,183
Imports,	1906	146,117
	1905	102,158
	Increase	43,959

Great Britain (Five Months).—Gross Tons.

Exports,	1906	1,732,513
	1905	1,424,613
	Increase	307,900
Imports,	1906	633,677
	1905	550,749
	Increase	82,928

In general these increases in both imports and exports indicate a greater freedom in the international movement, while a part of the increase is due to specialization of one country or another in the carrying on of one stage or another of manufacture.

In referring to the figures for the United States, it must be premised that not all of the 154,000 tons apparent increase in exports is real, as pipes and fittings were returned for the early part of 1906, but not for 1905, the quantity amounting to some 54,000 tons, but as there is no doubt that exports of this class of material have increased largely, not all of the 54,000 tons should be deducted to make the figure strictly comparable, and it remains that there has been an actual increase of more than 100,000 tons. Rails are to be credited with some 24,000 tons of the increase, and structural material with 7000 tons. Some of the exported steel products are made from imported pig iron, with rebate of duty, and to this extent it is but natural that as exports increase imports should also increase. The increase in pig iron imports was about 45,000 tons, or nearly three-fourths of the total increase in imports. Ferromanganese and spiegel figure largely here. However, there was an increase of some 22,000 tons in exports of ingots, slabs, billets, sheet bars, &c., and it is not the fact that these were made largely from imported pig iron, although with rails and a number of other exported products such has been the case. A large part of the increase in American exports is due to the activity of the United States Steel Products Export Company.

The case is somewhat the same with Germany, the associations of manufacturers in that country promoting exports by united action. As the trade grows the need of certain cruder materials increases and importing is promoted.

In England the case is somewhat different. While her trade has expanded in nearly all lines of finished product, the import movement in semifinished material is mixed. England of course draws greater quantities of crude steel from abroad, showing an increase in the periods compared of 18,000 tons, but in the same time her imports of pig iron decreased by almost as much. In two notable directions her exports have not increased—rails and black and tin plates. The decrease in rail exports is 55,000 tons, but there was so large a decrease to Sweden and the British East Indies, accompanied by large increases to Portuguese East Africa and the Argentine Republic, that the difference in the totals cannot be taken to mean much. In tin plate exports it is different. The total drop was 4500 tons, but there was a drop of 7907 tons to the United States and 5358 tons to Canada, a total of 13,265 tons, due to the activity of the leading tin plate interest of the United States. Otherwise there was a fair increase. In black plates there was a large drop to Russia and a smaller increase to Germany and Belgium.

Altogether, it is apparent that the channels of international iron and steel trade are better lubricated every year and a freer interchange is made, with greater or less benefit to all.

Labor Unions and the New San Francisco.

It seems not to have occurred to those responsible for the policy of the labor unions in San Francisco that it will depend much upon them to what extent and with what rapidity the city is restored. The fearful handicap of the disaster of April 18 must be faced and combated at every step in the painful process of creating a new city that shall have some semblance of the attractiveness of the old. Already there has been a migration to other cities in the coast region and tens of thousands have left San Francisco never to return. Those who venture their capital on the site of to-day's ruin will need every encouragement. Instead, if reports are to be believed, the exactions of the labor unions are even greater than those that in other days made San Francisco notorious for the tyranny of the "sand lots." At $8.50 a day for bricklayers and $12 for carpenters, and the insistence of the unions that no independent mechanic shall have work, the situation is simply a notification to outside capital that it comes in at its own peril. The record of the unions in the old San Francisco was bad enough. But then capital was already planted and could not help itself. There could scarcely be greater folly than that of the unions to-day in practically announcing that the new estate is to be worse than the first.

In Germany latest reports emphasize the fact that it is the home market that controls the situation at present both in iron and coal. Owing to a combination of causes, largely car shortage and labor scarcity, the coal syndicates are able to get out only about 85 per cent. of their allotments, and the scant fuel supply has become a leadin factor in the iron trade, dominating the situation in much the same way that was seen in the United States in 1902 and early in 1903. At the same time a record

consumption of iron and steel in Germany has resulted in a condition without a parallel in the iron trade there—such firmness in the export market as has brought prices on this business in most lines to the level of domestic prices. On railroad material the mills are practically backed to the end of the year, and export rail orders have been declined because desired deliveries cannot be made. Such a condition speaks strongly of the unprecedented strength of the iron markets of the world.

CORRESPONDENCE.

St. Lawrence Iron Sands.

To the Editor: An interesting experiment was lately tried at the No. 2 mill of Witherbee, Sherman & Co., at Mineville, N. Y., in treating magnetically the iron sands of the St. Lawrence. This sample was run through the regular Magnetic Separator Company's belt type machine. The tailings from this machine were afterward treated with the type E Wetherill machine with the following results:

Heads from Belt Type Machine.

Metallic iron	68.28
Titanium	0.24
Phosphorus	0.033

Type E, Pole No. 1.

Metallic iron	44.73
Titanium	13.84

Type E, Pole No. 2.

Metallic iron	44.51
Titanium	12.18

Tailings.

Metallic iron	13.19
Titanium	3.92

This experiment shows conclusively that the titanium is not combined with the magnetic oxide of iron, as the tailings from the Magnetic Separator Company's belt machine were practically free from any particles which could be attracted by magnets of ordinary strength.

Just what the combination of iron and titanium may be in the tailings is a question which I leave for others to decide. The separation effect showed that about one-third of the mass of material was composed of crystals of the magnetic oxide of iron, and the concentrates made show that the titanium was eliminated down to the point where it would be harmless in the blast furnace.

MAGNETIC.

Rust Boiler Company.—This company, the maker of the Rust water tube boilers, has placed a contract with the Riter-Conley Mfg. Company of Pittsburgh for a new plant, which will be located at Midland, Pa., about 40 miles from Pittsburgh, on the Cleveland & Pittsburgh Division of the Pennsylvania Railroad. The main building will be 100 x 500 feet, of steel and brick construction, and will be fitted with modern machinery and equipment throughout. The plant as designed will have a capacity of 200,000 horse-power a year of boilers. The power plant will also be built in addition to office buildings, pattern shops and warehouses. The works will be in active operation before January 1, 1907. The offices of the Rust Boiler Company are in the National Bank Building, Pittsburgh.

Efforts which thus far have been crowned with a great deal of success are being made by the National Metal Trades Association to include in its membership the automobile manufacturers. Already a number of the important automobile manufacturing companies in the country have become members of the association and there is every indication that a majority of them will soon be enrolled as members. The enrollment of these new members means that the open shop policy is to be adopted by the manufacturers of automobiles. They employ the same class of help as the present members of the association, and the adoption of its policy toward labor unions will mean a considerable extension in the number of open shops in the country.

OBITUARY.

GEORGE J. SNELUS.

GEORGE J. SNELUS, the famous metallurgist and a vice-president of the Iron and Steel Institute since 1889, died June 20, at his residence, Ennerdale Hall, Fritzington, Cumberland, England. He was born June 25, 1837. Mr. Snelus was a recipient of the Bessemer gold medal in 1883 for being "the first to produce Bessemer steel by the basic process," Mr. Thomas receiving this medal at the same time. Few members of the Institute have been such prolific contributors to the discussions. An enumeration of his papers and other contributions filled five pages of the Name Index of the *Journal* of the Institute published in 1898. In March, 1872, Mr. Snelus took out a patent on the employment of basic linings in furnaces and crucibles and made the first piece of basic metal. In this patent he joined Sidney Thomas and James Riley seven years later, and though patents were secured only in England and the United States Mr. Snelus drew about $175,000 as his share of the royalties. In 1871 he came to the United States as expert on behalf of the Iron and Steel Institute to report fully on the Danks puddling furnace. In the early seventies he became general manager of the Bessemer Steel Works, at West Cumberland, remaining in this position until 1890. In the past few years Mr. Snelus took out patents for making steel direct from the furnace by means of a rotary converter heated by the waste gases from the blast furnace and the hot blast. He also had a patent on converting the waste gases from the blast furnace into useful gas by passing the waste gas through a vertical regenerator. The Distington Iron Company put up a 10-ton rotator to test the first process, which also covers the making of a refined iron.

C. C. KNIGHT, senior member of the firm of C. C. Knight & Co., iron merchants, Sixteenth and Callowhill streets, Philadelphia, one of the oldest iron firms in the country, died June 19, aged 77 years. He was a director of the Consolidation National Bank and was one of the oldest members of the Union League. Colonel Knight was a member of the famous Old Washington Grays at the outbreak of the Civil War, and was later staff officer of the One Hundred and Nineteenth Pennsylvania Volunteers. He was a member of the Old Guard of the Grays, the Loyal Legion and the Veteran Corps. He is survived by a widow, a daughter and two sons.

DANIEL M. CURRY of the firm of Curry & Co., machinists, Danville, Pa., died June 18, aged 45 years. He learned the trade of machinist with his father in the Enterprise Foundry, in which the latter had an interest as partner. He next became foreman, under W. C. Frick, of the works at present owned by Curry & Co. About 11 years ago he entered into partnership with F. H. Vannan, under the firm name of Curry & Vannan, and last fall, when Mr. Vannan retired, Mr. Curry took over the plant, which has since then been conducted by him under the firm name of Curry & Co.

CHARLES E. TRIPLER, who attracted considerable attention about six years ago, when he announced that he had discovered a process by which liquid air could be manufactured, died June 20, at Liberty, N. Y., aged 57 years.

THOMAS M. BELL, who has been connected with Eastern railroad supply houses for many years, died at his home in Philadelphia June 22, aged 54 years. Mr. Bell was one of the incorporators of the Charles Scott Spring Company, but at the time of his death was connected with the sales department of the American Steel Foundry Company. He leaves a widow and one son.

The announcement has just reached this country of the death of A. Ledebur, professor of metallurgy at the School of Mines of Freiberg, Saxony, a prolific writer on and investigator of subjects connected with the metallury of iron and steel.

Manufacture of Soil Pipes and Fittings.*

BY T. J. BEST.

The first requisite in the art of making soil pipes and fittings is a well lighted and ventilated foundry. A shop 86 x 200 feet will be required for a melt of from 20 to 25 tons per day. Light should come from each side and end, also from one or two monitors running nearly the full length of the roof, with pivoted sash duly placed in them. This will make the center of the shop nearly as light as at the sides. Perfect ventilation will also be assured. The mill, or cleaning, chipping, and oiling rooms, should be at one end of the foundry, separated by a fireproof wall. The mill room should be large enough for 12 to 16 ordinary mills. If, however, exhaust mills are used, a smaller number will answer.

The floor plan of the foundry could be laid out as follows: On the side nearest to the cupola a passage about 6 feet wide should be arranged for, extending from end to end. Then the pipe floors are laid out, each about 11 x 45 feet. The floors should run crosswise to the foundry, and then another passage of 5 feet laid out, also extending the full length of the building. There should be a good wide passage in front of the cupola, which should connect the longitudinal passages. In the center of each passage a narrow gauge industrial railway should be laid down, and provided with proper turntables at each end and at the center passage. This railway should continue through the mill room.

The mill room should be about 20 x 80 feet, the mills to be placed on each side. A turntable should be placed so that work may be taken from the mills when clean and sent to the chipping and grinding room, from which it should be continued to the oiling room, and thence to the shipping sheds.

The Method of Molding.

In the center portions of the pipe floors, at proper distances apart from each other, there should be set and secured firmly iron rails or small I beams, on which to rest mold boxes and machines. In the center of the passage between floors tee irons should be suspended from the roof, well stayed, and high enough to allow men to walk beneath them. This is for the purpose of resting the mold boxes against them while on end, after the heat has been poured and the boxes shaken out at night. A good supply of trucks is essential to carry out the castings either by night or day, as may be desired. In any case a few men with good trucks can clean up the foundry very quickly.

The machines or follow boards, on which the pipes are made, as well as sizes and weights of mold boxes, vary in different establishments. Some foundries use machines run by steam, others use hydraulic power or compressed air, to press the mold. The general way, however, is to do the work by hand ramming. The pattern should be made very accurately and be well fitted. I have seen patterns made with rather more than half circle and finished with files and emery cloth. This is a tedious and crude way. By all means see that good sound castings are provided, and turn them up. If you have a universal grinder, finish your patterns by grinding them. Too much care cannot be given the machines and patterns. The plates and stops for mold boxes must be accurate. The mechanism for raising and lowering patterns should be as simple as possible, with the precaution that the patterns should be raised vertically only. I have seen cam motions that would lift patterns slightly sidewise, while others would lift toward one end. This is liable to make an overlap one way or the other. Patterns for 2 inch and 3 inch pipe are made two in a box. In many places the 4-inch are also made two in a box, but with a single pattern and a light box one man can make 35 and in many cases 45 4-inch pipes a day, if two men are working together. Another advantage is that when one man rams the mold it will be uniform. Two men working on a mold will not ram up the same, and the result is an uneven casting. Good results are obtained with one man on a floor and the understanding that the men lift for each other, and also help set the cores.

The light pipes should be made in the center of the shop, so that the hottest iron may be poured there. The heavier material can be cast at the ends of the foundry, and the metal taken there in small bull ladles holding 500 to 600 pounds, on an overhead system. This will save a lot of hard work. The fitting floors can all be stationed at one side of the foundry, or in any other part not taken up by pipe floors.

The Care of Patterns.

All fitting patterns should be well finished and set true in follow boards. The 4-inch tees, as well as all other small patterns, are made two in a box. This refers to shell patterns. I have seen a man make 80 4-inch elbows in a day, but both patterns and follow boards must be first-class to do this.

Follow boards and patterns must be kept clean. The boards should be well coated with shellac varnish, and patterns with a composition to prevent rust. For this purpose a good article consists of 4 ounces sperm wax and 4 of beeswax melted together. Benzine is added, as well as plumbago, to make a stiff paste. Put this on the patterns with a paint brush and polish with an ordinary stove brush. A boy can keep quite a number of patterns in good condition. Molders can and will make more and better work when they have the best of patterns to work with.

The pattern storage is another important thing. The mold board should be given a letter or figure. A corresponding letter or figure should be placed on the rack or shelf on which the pattern is to be kept. The storage should be well ventilated and lighted. Fireproof doors and shutters are necessary. These may be expensive, but will pay in the end. All pipe patterns should be cleaned off every day and the mechanism oiled. It will not take long to do this, but neglect of it will soon run up into money.

There should be a plentiful water supply. Six or eight water barrels set on the floor will be of great benefit to the men. It will enable them to drink and to wet the core boxes and bars as required without walking a long distance.

Sometimes there has been difficulty in pouring the full heat. A good plan is to train every man to carry iron. Every laborer should be given a ladle full of the first tap and be made to carry it to some part of the shop and dump it into a conical pot. Of these there should be quite a number throughout the foundry. Putting the iron into them is far better than spilling it on the floor to be gathered up next morning. Nice, clean ingot scrap is the result, and no sand or dirt to go into the cupola. If every new man is trained as above mentioned there will never be trouble about having men on hand to take away the full heat.

Better Pipe and Fittings Demanded.

We have to turn out a better grade of pipe and fittings than formerly. I do not know how it is with you in the United States, but we in Canada are forbidden to use the broad mantle of charity that covers a multitude of sins—that is to say, the hot tar pot. Our pipes and fittings must be oiled, or dipped into a mixture of oil and benzine. The oiling room should have two or more tanks in which all pipes and fittings can be immersed; also suitable drainage racks on which pipes can be stood on end, the surplus oil running back into the tanks. The fittings are dipped and thrown on a drainage rack. Racks about 2 feet apart and as long as convenient may be set up, bars of ¾-inch pipe being placed about every 2 feet to form pockets or divisions. This will prevent the oiled pipe from falling over, and by the time the rack is filled the first pipes will be ready to go to the shipping room. Some foundries dip their pipes on the side, while others dip on end. This may be carried out just as is desired or convenient.

Pipe Cores.

There are various ways of making cores. They are now, however, usually made of green sand. Some foundries do their ramming by hand, others by means of squeezers, and still others in vertical core boxes made

* A paper read at the Cleveland convention of the American Foundrymen's Association, June 5-7, 1906.

in three parts. In the boxes the back part is held stationary and the other two parts are hinged to it. The core bar is whetted and put into position. Then a tube, having a screw with a coarse thread at the lower end, is lowered over the core bar, a small quantity of sand thrown in and the screw revolved by machinery. A man throws the sand into the hopper and as the screw revolves it packs the core, which raises itself at the same time. There are balance weights on a chain which regulate the pressure put on the sand in the box. This machine is very good, but also very expensive, and is being superseded by the horizontal machine. There is a great variety of these machines. For instance, I have seen a long riddle suspended so as to sift the sand down on a core bar. The noise of the mechanism could be heard a long way off and was very annoying. Others are made with a shaft on which a number of wheels are made to revolve and thus shake the sand on the bars. Whatever the style, the bar revolves and the sand falls on it from above. As the sand impinges it is rotated against the steel knife provided and shaped for the purpose. From 500 to 600 cores can be made and used each day on a good machine, in sizes from 2 to 6 inches in diameter. The change from one size to another can be made in a minute.

Cupola and Melting.

We read so much about high and low melting ratios. The trouble is that we do not take time to think deeply enough about our business. For instance, not long ago I read of a foundry having a 52-inch cupola melting about 20,000 pounds a day at a ratio of 6 to 1. They could not understand why others were getting better results. I do not pretend to know as much about what I have given here as I ought to, yet I do say that if we want to be successful we must proportion things properly. Therefore for a plant such as I have described in this paper, in which from 20 to 25 tons a day are cast, the cupola should measure about 45 inches inside the lining, which should be double brick. At least six tuyeres 4 by 12 inches should be arranged for. The main blast pipe should be 18 inches diameter, and if convenient let down each side of the cupola in two 13-inch pipes. The blower, which I prefer to have a positive one, should be as near the cupola as convenient. In this way from 3500 to 4000 cubic feet of air will be furnished each ton of iron melted and there will be no difficulty in getting a 10 to 1 ratio. It must be borne in mind, however, that it is as important to look after the coke as any other part of the melting scheme, and suitable dry sheds should be provided for it as well as the sand.

For pipe and fittings the metal required should be both hot and clean. In order to have this let the melt be as continuous as possible. A convenient ladle should be kept under the spout, and after the metal is tapped it should not be stopped again during the whole pouring operation. The tuyeres for this class of castings should be placed lower than where iron is held in the cupola. In order to get rid of the slag the spout should be made special, as follows: About one-half down the length of the spout an opening should be made in one side, and about 4 inches ahead of this opening there should be inserted a fire brick on edge, so as to form a trap or depression, under which the iron must pass, or rise to about the same level again on the other side of the brick. Then the slag, which is lighter than the iron, will flow off at the side of the opening, and can be led to any desired place. It will be advisable to cover that portion of the spout nearest the cupola. Keep a little wood or charcoal floating on the slag. This will keep it hot and insure its flowing easily, at the same time keeping your iron clean.

The Attorney-General of New York State has given an opinion that the eight-hour law as re-enacted by the Legislature cannot prevent a contractor or subcontractor from purchasing in the open market a completed article which may enter into the construction of the work contracted for, without regard to whether it was manufactured in accordance with the law limiting the hours of labor.

Decisions in Customs Cases.

The Government Again Loses on Steel Strips.

For the second time the Treasury Department has been defeated in its attempt to collect an additional duty of 1 cent per pound on cold rolled steel strips used for making car seat springs. Judge Lacombe, in the United States Circuit Court for the Southern District of New York, decided last week that the merchandise does not come within the tariff paragraph imposing the extra tax. The case stood in the name of the Crucible Steel Company of America, but a large number of importing and manufacturing concerns are directly interested in the litigation. This is the second time the steel strip issue has been before the Federal courts. In a former litigation the United States Circuit Court of Appeals, in a decision written by Judge Lacombe, sustained the Crucible Steel Company's protest against the additional duty. Secretary Shaw was dissatisfied with the outcome of that case and directed the customs authorities to prepare a new case. In his latest decision Judge Lacombe says in part:

> I cannot see that the additional evidence as to trade designation differentiates this case from that which was before the Circuit Court of Appeals. That court disposed of the question presented upon the theory that Congress used the terms it employed with the meaning which had theretofore been given them by the customs authorities under earlier acts.

It is understood that domestic steel manufacturers would like to have the Government continue the litigation with the ultimate hope that the foreign strips may be held to be subject to the extra duty for merchandise of this kind, which has been brightened in the process of manufacture. Many importers' protests raising a question similar to that embodied in the test suit have been placed on the suspended files of the Board of Appraisers, where they will remain until the termination of the litigation. If the Government finally loses a large sum in refunds will be paid importers out of the Federal Treasury.

Forged Steel Bars Classed as Bars.

In a decision written by I. F. Fischer, the Board of United States General Appraisers on June 23 sustained a protest filed by Thomas Prosser & Son of New York, it being held that forged steel bars are properly dutiable at the rate of 2 cents per pound under the provision in the Dingley Tariff law for "steel in all forms and shapes." The classifying officers of customs insisted that the merchandise came within the provision for steel forgings. The Board of Appraisers, however, reaches an opposite conclusion.

Old Anchors Are Not Scrap.

The troublesome question of what constitutes scrap iron and steel for dutiable purposes appeared in a new form on June 23, when the Board of United States General Appraisers decided that old iron anchors cannot be deemed "scrap." The anchors were entered at Philadelphia by Henry A. Hitner's Sons. The collector levied 1½ cents per pound under the provision in the tariff for "anchors." The importers carried their case to the General Board, where it was insisted that as the anchors were old and worn out they should take a duty of $4 a ton under the paragraph for scrap iron. Hitner's Sons cited the decision of a Federal court in the case of Ginsburg against the United States, in which the court found that certain fish plates were in such a bad and worn condition as to be wholly useless for rail or track purposes and had no commercial value except as scrap steel. It was held that the plates were dutiable as scrap steel, no proof being shown that they had lost their identity as anchors.

Minor Decisions.

On June 21, the Board of Appraisers made a ruling affecting castings for chimney places. On some cast iron plates with ornamentation in bas relief 45 per cent. ad valorem was assessed on the theory that the merchandise was dutiable under the provision for manufactures of metal. The importer, R. Rossman of New York, maintained that the articles were entitled to enter at the rate of 0.8 cent per pound as castings, which have not been advanced by any subsequent process of manufacture. The board endorses this claim.

On the protest of Michael Hayman & Co. of Buffalo,

who claimed that brass skimmings and ashes, fit only for remanufacture, are free of duty, the assessment of 20 per cent. ad valorem imposed by the customs authorities was found by the board to be illegal.

It has been determined by the Board of Appraisers that so-called pinning, or lengths of planed wood, in which are set wire teeth, are properly dutiable as manufactures of wood. The merchandise was imported by the Lungstras Dyeing & Cleaning Company of St. Louis. The appraisers reported that the articles were composed in chief value of metal, whereupon the collector exacted duty on the basis of 45 per cent., but this is now changed to 35 per cent.

NEWS OF THE WORKS.

Iron and Steel.

James A. Moore, Seattle, Wash., and associates, for whom Walter Kennedy of Pittsburgh is preparing plans for a new blast furnace, have purchased 15 acres of land as a site for the new steel plant which the promoters contemplate building.

The 9 and 10 inch mills at the Valley works of the Republic Iron & Steel Company at Youngstown, Ohio, which have been idle for some time, were started up last week.

The blast furnace of the Sharpsville Furnace Company at Sharpsville, Pa., recently taken over by Edwin N. Ohl, A. W. Thompson and others, and which has been idle for several years, was put in blast last week. The furnace is a small one and is expected to make 125 tons of Bessemer iron per day, all of which will go to the Jones & Laughlin Steel Company at Pittsburgh for the balance of this year.

The Bessemer steel plant, Valley and Brown-Bonnell plants of the Republic Iron & Steel Company, Youngstown, Ohio, will be closed for about two weeks in the first part of July for repairs and improvements.

The National works of the National Tube Company and several other plants of subsidiary interests of the United States Steel Corporation in the McKeesport, Pa., district will be closed for a week or ten days in July for repairs and stock taking. The shut down of these plants will be as brief as possible, as they are full of work and will not be idle any longer than is absolutely necessary to take stock and make needed repairs.

The sheet mill plant of the Youngstown Iron & Steel Roofing Company at Youngstown, Ohio, will close down only one day during the first week of July, in order to give the men the national holiday. This plant is crowded with orders for black and galvanized sheets and other products.

The National Tube Company is preparing to erect an ingot mold foundry adjoining its plant at South Lorain, and as soon as it can be placed in operation it will produce its own ingot molds. The company is adding two new furnaces at Lorain and is extending its dock 450 feet and installing additional machinery for handling material.

General Machinery.

The Case Mfg. Company, Columbus, Ohio, has recently been favored with several large contracts from the leading railroads for its electric cranes as well as from manufacturing concerns. To date the company has closed more orders for cranes and hoists than for the entire year of 1905.

The Hickson Mfg. Company, Muncie, Ind., manufacturer of iron bedsteads, is to erect large works at Pittsburgh, Pa. The new plant will cover 20 acres of ground and will employ 1200 men. The Muncie works will be operated as formerly, but only to care for the trade of Indiana, Illinois and Ohio. The company will require some new machine tools, including drills, shapers, grinders and polishers, but not a great deal of machinery is used in this line of manufacture. A power plant will be installed and there will be every convenience for the rapid handling of the work.

The W. P. Davis Machine Company, Rochester, N. Y., has taken out a permit for the construction of another new building for the new plant which the company is to establish. The new building is to cost about $24,000 and is to be used as a machine shop.

The E. R. Thomas Motor Company, Buffalo, N. Y., which is building an extensive addition to its plant, has placed the greater part of the contract for machinery, amounting to about $50,000. The purchases include a 200 horse-power gas engine, with which the company intends to generate its own electricity, for which it will purchase two 75-kw. generators and a number of motors. No steps have as yet been taken regarding the heating and shafting, but the company will probably consider this shortly.

The Colburn Machine Tool Company, Franklin, Pa., builder of vertical boring and turning mills, reports a very satisfactory domestic and foreign trade on these lines of goods. The company has recently added largely to its machinery equipment in order to take care of its rapidly growing business.

The Jann & Shank Mfg. Company, Chicago, has been incorporated with a capital stock of $10,000 to manufacture light machines and tools. The company is now equipping a modern shop. The officers, who are Cyrus Shank, president; C. A. Jann, vice-president, and J. Hubert Jann, secretary and treasurer, were formerly associated with the Western Tool Works, Galesburg, Ill., which they established in 1900, but have sold their interest in that company.

Power Plant Equipment.

Both the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company, Pittsburgh, have recently received large orders for equipment for the electrification of railroads. Orders have been received from the Erie Railroad for electrifying its Rochester & Mt. Morris division, a distance of 35 miles; Delaware, Lackawanna & Western Railroad, two Westinghouse-Parsons steam turbines to drive a 500-kw. generator to be supplied with steam by Babcock & Wilcox boilers for the terminal at Hoboken, N. J.; Burlington municipal lighting plant, Burlington, Vt., one turbo-generating unit; New York Navy Yard, two 500-kw. turbo-generator units.

The Crocker-Wheeler Company, Ampere, N. J., has recently sold to the Pusey & Jones Company, Wilmington, Del., 33 motors ranging from 1 to 25 horse-power; National Enameling & Stamping Company, Milwaukee, Wis., 300-kw. 250-volt generator.

The A. F. Priest Mfg. Company, maker of gas machines and other machinery, Milwaukee, Wis., has been incorporated with a capital stock of $100,000 by August F. Priest, Charles M. Kendall, Corie A. Nebeker and Arthur L. Hughes.

The Atlas Mfg. Company of Fostoria, Ohio, has entered into a contract with W. E. Flanders of Cleveland to manufacture gas engines, brass and aluminum parts for automobiles. The company is planning to erect an addition and increase its force to take care of a large amount of work which has been guaranteed.

Foundries.

The Amherst Malleable Iron Company, Limited, Amherst, N. S., has been incorporated with a capital stock of $100,000 to manufacture malleable iron castings. The company has started the erection of a plant to consist of a brick and steel building, 65 x 264 feet, for manufacturing, and a wooden building, 25 x 50 feet, for office purposes. The company expects to have its plant ready to melt about September 15. The officers are N. Curry, president; J. A. Crossman, first vice-president; G. Sauber, second vice-president; G. S. Crossman, secretary-treasurer, and J. J. Lawlor, managing director.

The Contractors' Tool Company, 704 Arch street, Philadelphia, Pa., manufacturer of general contractors' tools and machinery, expects to be in the market for new foundry appliances and would be pleased to communicate with manufacturers of brass and iron foundry equipment. The company was incorporated to take over the business carried on under the same name since 1898. The object of the new company in taking over the old one is to increase the capital and to extend the old business. The incorporators are C. P. Calver, who is manager; J. Walter Calver, Jr., J. W. Calver and Wilfred B. Walcott.

The Hanover Union Steel Castings Company, Hanover, Pa., was organized and incorporated under the State laws of New Jersey in April for the manufacture of a high grade of steel castings. The works have just commenced operation and are ready to receive business. They are under the management of T. J. Baker, New York, who has had many years' experience in the foundry business.

The new Federal Steel Casting Company has started work in its plant at Chester, Pa., where it poured its first heat from its 30-ton furnace on June 20. The company has the plant of the old Delaware River Steel Castings Company, which went into the hands of a receiver last year. It has improved the property. Among the prominent Chester men interested are H. H. Houston, John W. Booth, who was interested in the Delaware River Company, and J. H. F. Dixon. The company's main building is 127 x 500 feet, and it has a fine equipment. James Merritt is superintendent.

The Alliance Foundry Company has been formed at Alliance, Ohio, and is preparing for the erection of a foundry building, 75 x 100 feet, with two smaller buildings. The plant will be equipped for heavy foundry work, and the company contemplates making a specialty of the manufacture of the Schreyer heating furnace, at present manufactured in Columbus. The parties at the head of the project are unwilling to disclose their identity at present.

Bridges and Buildings.

Announcement has been made at Philadelphia and other cities in Pennsylvania of the consolidation of the Eyre Construction Company, capital $50,000, with the T. A. Shoemaker Company, under the corporate name of the Eyre-Shoemaker Company. The company, which does a general bridge and construction business, has a capital of $250,000 and will have an office in the Arcade Building, Philadelphia. The officers are T. L. Eyre, West Chester, Pa., president; A. B. Roecker, West Chester, secretary and treasurer; T. A. Shoemaker, Bellefonte, Pa.; W. M. Pyle, Wilmington, Del., and E. P. Harrison, Bel Air, Md., directors. The company has built a number of bridges for the

Pennsylvania Railroad and engaged in much general work. Mr. Eyre was formerly Superintendent of Public Buildings and Grounds of the Pennsylvania State Government, with offices at Harrisburg.

Fires.

The plants of the Atlanta Iron & Brass Bed Company and the Atlanta Spring Bed Company, Atlanta, Ga., were destroyed by fire June 21. The loss is estimated at $60,000.

The iron works of Heacock & Lawrence, Portland, Ore., were recently destroyed by fire. The loss is about $25,000.

The machine shop and other buildings of the plant of James B. Newbury, Coxsackie, N. Y., were recently burned. The loss is stated to be about $18,000.

Hardware.

The Sturges & Burn Mfg. Company, manufacturer of cans of various kinds and sheet metal specialties, Chicago, has recently increased its equipment by the installation of three new drawing presses and the addition of special tools and machines for the manufacture of ice cream freezers, a new product just added to the line of manufacture. The company is also considering adding two more drawing presses.

The Diamond Fabric Company of America, 1021-1027 Grand street, Hoboken, N. J., is owner of the patent granted to M. R. Mangam of Chicago in 1903 on improvement in wire mattresses. The company will manufacture this wire link fabric for sale to spring bed manufacturers, but will not manufacture the beds. Ten wire forming machines with electric power are being installed, which will provide a capacity of about 900 assorted sizes of fabrics per day. The company expects to be in a position to begin deliveries early in July.

The Standard Company, Torrington, Conn., manufacturer of spokes and nipples, pedals, toe clips and two-speed coaster brake hubs, is erecting two new buildings, each 77 x 290 feet. The buildings will be connected on the west end by the boiler house, 42 feet square.

The W. W. Miller Saddletree Company, Madison, Ind., has increased its capital stock from $5000 to $10,000.

The Durham Mfg. Company has been incorporated at Muncie, Ind., with $20,000 capital stock, to manufacture games and novelties. The directors are J. M. Maring, E. B. Ball, James E. Durham, and Herbert R. Bard.

Miscellaneous.

The Anderson Coupling & Supply Company, Kansas City, Mo., has purchased seven lots at Sixth street and Reynolds avenue, where it will build a new plant.

It is stated that the American Car & Foundry Company has awarded the contract for the construction of its new street car plant at St. Louis.

The Bubb Air Brake Company has been incorporated by J. S. Bubb of J. S. Bubb & Co., Kittanning, Pa.

J. S. Thorn & Co., Philadelphia, Pa., have begun the erection of a new building, 26 x 224 feet, the machinery to be operated by electric motors. No new machinery is required.

The Peckham Mfg. Company, Newark, N. J., manufacturer of polishing meal and polishing leathers, is building an addition to its plant 60 x 115 feet, which will contain a power plant of 500 horse-power. The engines, boilers and special machinery have been purchased and the new building is expected to be in operation within a couple of months.

The Standard Motor Truck Company, which is building a new plant at New Castle, Pa., will manufacture motor trucks for street railway and interurban service for all classes of cars.

The Clinton Iron Works, Clinton, Tenn., manufacturer of cooking and heating stoves and grates, is arranging to enlarge its plant.

New York Electric Fountain Company has been organized to manufacture electric fountains. D. H. Ettelson, 82 Beaver street, New York, is interested.

Albert Foyer, Painesville, Ohio, who has been engaged in the production of metal stampings in that place, has become associated with people at Elyria, Ohio, and is planning to erect a plant in that city for the production of stampings of various kinds.

Pennsylvania Steel Company Sales Meeting.—A meeting of the sales managers in charge of the branch offices of the Pennsylvania Steel Company and the Maryland Steel Company was held on Tuesday, Wednesday and Thursday, June 19, 20 and 21. Sessions were held at the various plants of the company, which were inspected in turn. The works at Sparrows Point, Md., were visited on Tuesday, the Steelton works on Wednesday, and on Thursday afternoon an opportunity was afforded to visit the Lebanon plant of the company, as well as the Cornwall iron mines. The affair was concluded on Thursday night with a dinner at the Harrisburg Club at Lebanon. The visitors were entertained by E. C. Felton, president Pennsylvania Steel Company, Philadelphia; J. V. W. Reynders, vice-president Pennsylvania Steel Company, Philadelphia; F. W. Wood, president Maryland Steel Company, Baltimore, and at Lebanon the tour of inspection was in charge of E. Dawson Coleman, resident director. The party included H. B. Green, San Francisco; J. G. Miller and G. H. Irwin, St. Louis; Robert E. Belknap, Chicago; R. C. Hoffman, J. G. Hill, H. F. Foster and R. C. Hoffman, Jr., Baltimore; Richard Peters, Jr., Philadelphia; Wm. C. Cuntz, Steelton; J. C. Jay, Jr., and R. W. Gillespie, New York; C. S. Clark, Boston. John F. Sheehan, general freight agent of the Pennsylvania Steel Company, Philadelphia, was also a member of the party.

PERSONAL.

H. E. Rice has been appointed general superintendent of the Atlanta Steel Hoop Company, Atlanta, Ga. Mr. Rice was previously superintendent of the rod mill department of the Dominion Iron & Steel Company, Sidney, Nova Scotia.

Niels A. Christensen has been retained by the Allis-Chalmers Company, Milwaukee, Wis., in the capacity of consulting engineer and has sold to that company the exclusive rights to manufacture and sell the air brakes and air compressors invented by him. Mr. Christensen, who is a Dane, first came to this country in 1891 and obtained employment with the Fraser & Chalmers Company. Shortly afterward he invented his system of applying air brakes to cars, but was unsuccessful in securing capital to manufacture it until 1897, when the Christensen Engineering Company was organized. In 1902 Mr. Christensen resigned and the company was merged in a new corporation known as the National Electric Company, which continued to construct air brakes for electric cars under his patents. This company went into the hands of a receiver in the spring of 1905, and ten months later was sold at public auction to interests representing the Westinghouse Air Brake Company, which legally surrendered all rights to the Christensen patented devices. The Allis-Chalmers Company is now fitting up a new shop particularly for manufacturing these devices.

President W. H. Whiteside of the Allis-Chalmers Company sailed for Liverpool June 19 and will devote several weeks to a recreation trip abroad, visiting points of interest in England, Germany, Switzerland and France.

P. Eyermann has resigned his position with Fairbanks, Morse & Co., Beloit, Wis., and is now connected with the Du Bois Iron Works, Du Bois, Pa., as chief engineer. He will add to steam pumps the manufacture of gas engines and gas producers.

Col. A. M. Shook of Tennessee, well known as a leader in the Southern iron trade, has agreed to serve on the International Policy Holders' Committee.

Charles Johns, for some years traveling salesman for the Seaman, Sleeth Company, Phœnix Roll Works, Pittsburgh, has been made general manager of the Interstate Iron & Steel Company, East Chicago, Ind.

Edwin N. Ohl, vice-president of the Cherry Valley Iron Company, Pittsburgh, has sailed for Europe, to be gone two months.

C. E. Aaron, president of the New York Leather Belting Company, sailed on June 21 for Europe on a pleasure and business trip, and while abroad he will probably visit the exposition at Milan.

Joseph W. Ripley has been appointed by the Panama Canal Commission to be general superintendent of locks in Panama.

Walter Clarke Dean has opened offices in the Bank of Commerce Building, Norfolk, Va., where he will represent the C. & C. Electric Company.

The Sheet and Tin Plate Settlement.

The Amalgamated Association and the American Sheet & Tin Plate Company, in conference at Pittsburgh last week, came to a settlement of the sheet and tin plate scales for the scale year beginning July 1. Changes made in the new scales are unimportant and are wholly in the foot notes. The sheet mill scale of prices and the jobbing mill scale were reaffirmed without change. An important new feature of the scale this year was the adoption of the following table, which represents the minimum, base and maximum weight per square foot for each gauge on sheets and plates, as follows:

No. gauge.	Minimum.	Base.	Maximum.
1	11	11 25	11 80
2	10 32	10 625	10 93
3	9 7	10	10 3
4	9 1	9 375	9 6
5	8 5	8 75	9
6	7 85	8 125	8 4
7	7 3	7 5	7 8
8	6 65	6 875	7 2
9	6	6 25	6 5
10	5 45	5 625	5 9
11	4 7	5	5 3
12	4 15	4 375	4 6
13	3 535	3 75	4
14	3 041	3 125	3 4
15	2 725	2 8125	2 9
16	2 431	2 5	2 6
17	2 20	2 25	2 3
18	1 9	2	2 10
19	1 7	1 75	1 8
20	1 463	1 50	1 60
21	1 35	1 375	1 43
22	1 19	1 25	1 31
23	1 07	1 125	1 18
24	94	1	1 06
25	82	875	93
26	72	75	81
27	66	6875	715
28	60	625	650
29	532	5625	593
30	469	5	531
31	4226	4375	468
32	3907	40625	4218
33	3596	375	396
34	32845	3437	359

NOTE.—The usual 2½ per cent. variation allowed by the United States Standard Gauge is included in above figures.

The following foot note, No. 1, was adopted:

When sheets are rolled lighter than the gauge they represent, the mean between that and the next lighter gauge to be taken for the rolling price.

Another new foot note, No. 24, was also added, as follows:

Roughers running over iron to receive 10 cents per heat; 15 pair of double iron to constitute a heat.

In the foot notes under the sheet mill hand scale, No. 9, in the old scale, which read as follows:

All sheet and jobbing mills working sheets over 30 inches wide shall be classed as large double mills. Mills working 30 and under in width are classed as small mills, but mills classed as small mills that work over 30 in width and not exceeding 34 inches, the day hands to be paid large mill prices while employed on these widths. This is to apply to mills classed as small doubling mills at present, and large mill prices be maintained on fire bed over 20 square feet,

was changed to read:

Any mill working over 28 inches wide during the week shall be classed as a small double mill, and there shall be no averaging done during that week.

On mills working 36 inches wide during the week, the day hands shall be paid large mill prices for all orders worked during that week.

Large mill prices shall be maintained on all orders over 30 inches wide; also on fire bed containing over 20 square feet.

Foot note No. 14, which in the old scale read as follows:

It is agreed that no more than three changes in the classification of any sheet or jobbing mill can be made during the scale year,

was changed to read:

There shall be no more than three changes in the classification from sheet to tin mills during scale year.

No change was made in the scale for roughing and catching on sheet and jobbing mills.

Prices in the tin plate scale were readopted without change. Foot note No. 21, which read in the old scale:

When, in the judgment of the manager, the work is too heavy for the catcher, the company shall furnish help,

was eliminated in the new scale.

The sheet and tin bar scale of prices was readopted without change. In the addenda foot note No. 1 in the old scale was stricken out.

The sheet and tin plate scales have been signed by the American Sheet & Tin Plate Company for all the mills for which it signed last year, but as yet no agreement has been reached with the independent sheet and tin plate manufacturers, who have asked the Amalgamated Association for a reduction of 12½ per cent. in both the sheet and tin plate scales. In other words, they have asked for the scale of wages in force at the Vandergrift nonunion mills of the American Sheet & Tin Plate Company, which is claimed to be at least 12½ per cent. lower than is being paid in the tin plate and sheet mills that sign the scale. The independent tin plate mills also ask that the base price of the scale, which at the present is $3.40 per box, be raised to $4 per box. These demands were refused by the Amalgamated Association, and the conferences between the independent sheet and tin plate mills and the Amalgamated Association, which were in session for three days last week, adjourned without a settlement being reached. It is not likely that further conferences will be held, and whether the independent sheet and tin plate manufacturers will allow their mills to remain idle after June 30, when the scale year expires, cannot be stated at this time.

The Founders' View of the Molders' Strike.

On behalf of the National Founders' Association, the following statement has been made concerning the strike now on at various foundry centers:

The present strike—the greatest strike in the history of the foundry business—was precipitated in Philadelphia solely because the union demanded that boys who had been only six months at the coremaking trade should be paid $2.75 a day, the same as a skilled coremaker who had been working years in the same line, or within 15 cents per day of the rate paid competent journeymen molders who had served many years at the trade. A further purpose was the crushing or crippling of the N. F. A. and forcing foundrymen generally—whether members of the N. F. A. or not—to recognize and treat with the union and to operate their shops under union agreements and union domination. The union believed, owing to the general prosperity in foundry interests throughout the country, that manufacturers would not resist, no matter what demands the union saw fit to make.

Had the demands been simply and solely for an advance in wage or shortening of hours, with a reasonable concession as to union restrictions, it is hardly probable that a strike would have ensued, as the manufacturers are always ready to pay good wages in times of prosperity.

The war has been waged by the union in vain and at great loss and hardship to its members. Over half a million dollars in wages has been irrevocably lost to the members of the union. Present returns show that the number of open shops will be largely increased as a result of this strike.

The general situation throughout the country is steadily improving. The tonnage is increasing and a very large number of men are being educated in the art of molding. A conservative estimate of new molders who will be educated as a result of the strike would be not far from 3000. It is estimated that nearly 1000 molding machines have been installed since May 1, and many more have been ordered. The foundrymen are waking up to the money earning power of the molding machine operated by an intelligent, handy man.

Judge Elbert H. Gary, chairman of the Board of Directors of the Steel Corporation, estimates that the unfilled business on the books of the company on July 1 will be close to 7,000,000 tons. This is very nearly as much as was shown at the end of the first quarter of the year, and compares with 4,829,655 tons of unfilled orders on July 1, 1905, and 3, 192,277 tons on July 1, 1904.

The Iron and Metal Trades

The flow of orders in the finished trade continues very large. No better proof of this can be furnished than the fact that during the first 22 days of the current month the United States Steel Corporation booked orders at the rate of 37,000 tons per day. This compares with 18,600 tons per day during the corresponding period of 1905, thus showing practically double the quantity. The pressure from buyers abroad is particularly noteworthy and foreign markets have been responding. During the week American Rail mills have booked 35,000 tons of Steel Rails, chiefly from Mexican and Japanese roads, and negotiations are pending for further quantities with South America. There is some chance of this work being taken, because it permits of winter rolling. There is no hope of accepting any of the large Canadian tonnage, part of which has just been placed with local works.

For the home markets there are only occasional moderate sales for delivery during this year, there being included in these this week 5500 tons for the Grand Trunk system's lines on this side of the border and 3000 tons for the Northern Electric Company of San Francisco. The sales for 1907 delivery include 12,500 tons to the Lackawanna, 11,500 tons to the Norfolk and Western, a part of its requirements; 10,000 tons to the Wabash, 5000 tons for the Central of New Jersey and 6000 tons for the Northern Electric of San Francisco. The railroads have been ordering a good deal of bridge work, the total footing up close to 20,000 tons, including 3000 tons for the Erie. The Southern Railroad is in the market for 9000 tons. St. Louis is to have a large new bridge over the Mississippi.

The Plate trade has shown increased activity and new work is flowing in from a number of channels. In connection with the Torresdale filter plant of Philadelphia over 100,000 feet of Steel Pipe has been awarded. The Steel for only a part of this, say 6000 tons, has been provided for under an old arrangement. The balance of the Steel Plates has not yet been arranged for. The announcement is made that the 48-inch mill of the Cambria Company is now in operation. The movement in Sheets is very heavy.

The Wire trade is displaying activity, and it is reported that the American Steel & Wire Company will start full operations with the beginning of July.

Steel making Pig Irons are scarce. The Steel Corporation has secured 10,000 tons for September delivery, but it is not quite certain yet whether any additional tonnage will be available for August. In the East a leading interest has purchased about 10,000 tons of Basic Pig. We note also the sale of one lot of 5000 tons of foreign Low Phosphorus Pig at about $23.25, duty paid, Baltimore, for Steel founders.

Somewhat conflicting reports are at hand concerning the Foundry Pig Iron situation. So far as can be learned the leading Southern furnace interests have sold to a few large founders an aggregate of from 100,000 to 125,000 tons, for early and forward delivery, with some additional large business pending. It is asserted that in some instances a moderate further concession was granted. From all the markets come the report of quite a considerable number of sales of smaller lots of Southern Iron for fairly prompt delivery, at better figures than those realized on large long time contracts.

In the different competitive markets where Southern Irons meet metal produced in Northern districts the latter have not come down to parity, the impression being that the amount of Iron which Southern furnaces can or will sell is not large, after all, and that the flurry is practically over.

The Tennessee and Republic companies announce officially that the system of quoting Foundry Iron on the Birmingham basis has been abolished and that henceforth prices will be made, delivered, in the different markets in which the Iron is sold. In other words, the companies will meet local market conditions, East, West or South, as they exist.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	June27, 1906.	June20, 1906.	May30, 1906.	June28, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$18.25*	$18.50	$18.50	$16.50
Foundry No. 2, Southern, Cincinnati	*16.00*	16.25	16.75	14.00
Foundry No. 2, Local, Chicago	*18.00*	18.00	18.50	16.25
Bessemer, Pittsburgh	**18.35**	18.35	18.10	15.35
Gray Forge, Pittsburgh	16.35	16.35	16.35	14.85
Lake Superior Charcoal, Chicago	19.00	19.00	19.00	16.50
BILLETS, RAILS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	**27.00**	27.00	26.00	21.00
Forging Billets, Pittsburgh	**33.00**	33.00	32.00	25.00
Open Hearth Billets, Phila	**29.00**	29.00	28.00	26.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	32.50
Steel Rails, Heavy, Eastern Mills	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	14.00	14.00	14.00	13.00
O. Steel Rails, Philadelphia	*16.00*	16.25	16.25	15.25
O. Iron Rails, Chicago	21.25	21.25	21.25	17.25
O. Iron Rails, Philadelphia	*20.00*	20.50	21.00	18.00
O. Car Wheels, Chicago	*18.00*	18.00	19.00	14.25
O. Car Wheels, Philadelphia	**16.75**	16.75	16.50	14.50
Heavy Steel Scrap, Pittsburgh	**15.50**	15.50	14.50	13.50
Heavy Steel Scrap, Chicago	....	13.00	14.00	12.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.63½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.50
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.55
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.54½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.40
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh	.1.60	1.60	1.60	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	**2.40**	2.45	2.25	2.20
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	*1.75*	1.75	1.80	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Copper, New York	*18.62½*	18.62½	18.75	15.00
Spelter, St. Louis	**5.97½**	6.10	5.85	5.07½
Lead, New York	*5.87½*	5.90	6.00	4.55
Lead, St. Louis	*5.82½*	5.90	5.90	4.47½
Tin, New York	38.75	38.60	41.00	30.70
Antimony, Hallett, New York	*24.00*	24.00	27.00	11.50
Nickel, New York	**45.00**	45.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	$3.94	$3.94	$3.94	$3.74

Chicago.

FISHER BUILDING, June 27, 1906.—(*By Telegraph.*)

Contrary to expectations, Southern Iron prices have not declined below $13, Birmingham, for No. 2, and that the market is slightly recovering from the condition due to the abrogation of the $14 agreement is indicated by the refusal of producers to consider offers of large tonnages for future delivery on a basis slightly lower than that established immediately after the break. One large interest has established a minimum of $13.50 and has refused several large orders aggregating 6000 tons at $13. The fact that Southern furnace yards are barren of stocks has been an influence in preventing lower values, and large consumers with practically no stocks for immediate requirements, appreciating the condition, are preparing to cover. The International Harvester Company has made no purchases since those announced last week, but expects to close within a few days for 30,000 or 40,000 tons for delivery in the last half on a basis slightly lower than now prevailing and commensurate with so large a tonnage. There has been no falling off in the number of small orders for immediate needs, although the smaller buyers are deferring last half purchases and are awaiting developments. The attitude of consumers of Finished Material has not changed, and contracts are being closed freely for Sheets and Wire, deliveries running through the last half of the year on the former and on the latter to July of next year. The total requirements of Fence manufacturers during this period are estimated at 100,000 tons. Heavy specifications for Lake shipyards have strengthened the situation in Sheared Plates, while the scarcity of Universal Plates will be relieved by the operation of the new 48-inch mill of the Cambria Steel Company at Johnstown, Pa. Structural mills continue well up on

specifications, although fitters are securing large contracts, Western roads having placed large bridge requirements with independent mills. Iron and Steel mills will shut down this week for the usual summer repairs, but the Steel works will only be down over July 4 on account of pressure for material.

Pig Iron.—The attempts made by certain Southern interests to enforce a two-schedule plan, one for the East and another for the West, the former on a basis 50c. lower than the latter, is now reported as one of the several influences contributing to the break in Southern prices. The disastrous result of the attempted enforcement of a similar plan four years ago proved an insurmountable barrier to another trial with certain operators. Since the purchase of the International Harvester Company last week no large tonnages have been placed, and the refusal of furnaces to entertain less than $13 proved a surprise to many consumers. The idleness of the Trussville, Tutwiler and Chattanooga furnaces, two stacks of the Sloss-Sheffield Steel & Iron Company and several of the Republic and Tennessee interests has curtailed Southern production, and this, coupled with low stocks, makes the situation a strong one from the producing standpoint. Virginia operators are not attempting to compete and are holding both Basic and Foundry Iron at the prohibitory price of $16, furnace, equivalent to $18.85, Chicago. The buying of Northern Iron is also limited, and Lake Superior Charcoal is now down to the basis of $19, delivered. A typographical error in this report last week caused a reference to a 35,000-ton purchase by an Ohio Pipe works. It should have been 3500 tons. We quote as follows, f.o.b. Chicago:

Lake Superior Charcoal	$19.00
Northern Coke Foundry, No. 1	$18.50 to 18.75
Northern Coke Foundry, No. 2	18.00 to 18.25
Northern Coke Foundry, No. 3	17.50 to 17.75
Northern Scotch, No. 1	19.25 to 19.50
Ohio Strong Softeners, No. 1	18.55 to 18.80
Ohio Strong Softeners, No. 2	18.05 to 18.30
Southern Coke, No. 1	17.40 to 17.90
Southern Coke, No. 2	16.90 to 17.40
Southern Coke, No. 3	16.40 to 16.90
Southern Coke, No. 4	15.90 to 16.40
Southern Coke, No. 1 Soft	17.40 to 17.90
Southern Coke, No. 2 Soft	16.90 to 17.40
Southern Gray Forge	15.90 to 16.15
Southern Mottled	15.65
Malleable Bessemer	17.80 to 18.05
Standard Bessemer	19.30 to 19.55
Jackson Co. and Kentucky Silvery, 6 %	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %	23.30 to 23.80

Metals.—A slump has taken place in all Metals, including Pig Tin, Spelter, Lead and Antimony, and even Copper has lost some of its strength, though not materially changed in price. All the Metals named are easier in tone, following declines in the Eastern and foreign markets. We quote: Casting Copper, 18¾c. to 18⅞c.; Lake, 18⅞c. to 19¼c., in car lots; small lots, ¼c. to ⅝c. higher; Pig Tin, car lots, 42c. to 42½c.; small lots, 43c. to 43½c.; Spelter, prompt delivery, 6.15c. to 6.25c., for car lots; Lead, Desilverized, 6.07½c. to 6.15c., for 50-ton lots; Corroding, 6.57½c. to 6.67½c., for 50-ton lots; on car lots, 2¼c. per 100 lbs. higher; Cookson's Antimony, 28½c., and other grades, 26c. to 28c.; Sheet Zinc is $7.75 list, f.o.b. Laselle, in car lots of 60-lb. casks. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¾c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 5½c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—Western mills are unable to supply the demands of consumers of Forging Billets, and shipments for prompt requirements are now being made almost entirely from the East at prices ranging from $34 to $35 per net ton, Chicago. Notwithstanding the off season Rods continue in heavy demand and are held on the basis of $35 to $36, f.o.b. Chicago.

Rails and Track Supplies.—An advance of $1 a ton has been made by the largest Western producer of Light Rails, and a similar advance in Pittsburgh became effective last week. The demand for Spikes for prompt shipment is heavy and prices range from 2.25c. to 2.35c. For future requirements, however, quotations are considerably less and sales have been made on the basis of 2c. Rail contracts for 1907 delivery aggregating 10,000 tons have been placed with the Carnegie Steel Company. Quotations are as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $28 to $29; 25-lb., $30; 20-lb., $30 to $31; 16-lb., $31 to $32; 12-lb., $32 to $33, and lighter sections down to 8-lb., $38 to $40, f.o.b. mill. Standard Sections are unchanged at $28, f.o.b. mill, full freight to destination.

Structural Material.—Contracts for bridge work aggregating 4000 tons of Steel were placed by Western roads during the week, as follows: Chicago, Burlington & Quincy, 300 tons; Illinois Central, 2000 tons; Chicago Great Western, 300 tons; Chicago & Northwestern, 500 tons; Chicago, Milwaukee & St. Paul, 1200 tons. Notwithstanding the heavy tonnage that fitters continue to receive the Structural mills, with few exceptions, are well up on deliveries and can make shipments in three or four weeks. At St. Louis the erection of a free bridge over the Mississippi River, to cost $3,500,000, will shortly be up for consideration. At a recent election the issuance of bonds to this amount was authorized and engineers will shortly begin work. Quotations are unchanged, as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—The Cambria Steel Company announces the operation of its new 48-inch Universal Plate mill at Johnstown, Pa., and is prepared to receive orders on sizes 8 to 25 inches in width and 3-16 inch thick and heavier. The situation on Sheared Plates has improved to some extent on account of the heavy specifications that are being received from lake shipbuilders. Quotations are firmly maintained, as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8, up to 60 inches wide, 2.15c. to 2.25c.; Flange and Head quality, 25c. extra.

Sheets.—The recent advance in Sheet Bars is probably the forerunner of another advance on both Black and Galvanized Sheets, independent manufacturers being unable to compete on the present selling basis in view of the high cost of raw material. The demand is insistent, and contracts for delivery through the last half of the year are being freely made. On Black Sheets deliveries cannot be promised in less than 60 days, while on Galvanized three months is required by the mills. Prices are strong and unchanged, as follows: Blue Annealed, Nos. 9 and 10, 1.96½c. to 2.01½c.; Nos. 16 and 17, 2.16½c. to 2.21½c.; Box Annealed, Nos. 18 to 20, 2.36½c. to 2.41½c.; No. 27, 2.56½c. to 2.61½c.; No. 28, 2.66½c. to 2.71½c.; Galvanized Sheets, Nos. 10 to 14, 2.71½c.; Nos. 17 to 21, 2.96½c.; Nos. 22 to 24, 3.11½c.; Nos. 25 and 26, 3.31½c.; No. 27, 3.51½c.; No. 28, 3.71½c.; No. 30, 4.21½c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Box Annealed, Nos. 18 to 20, 2.50c. to 2.55c.; Nos. 22 to 24, 2.55c. to 2.60c.; No. 26, 2.60c. to 2.65c.; No. 27, 2.65c. to 2.70c.; No. 28, 2.75c. to 2.80c.; No. 30, 3.15c. to 3.20c. Galvanized from store: Nos. 10 to 20, 3c. to 3.05c.; Nos. 22 to 24, 3.15c. to 3.20c.; No. 26, 3.35c. to 3.40c.; No. 27, 3.55c. to 3.60c.; No. 28, 3.75c. to 3.80c.; No. 30, 4.95c. to 5c.

Bars.—While heavy contracts for Iron Bars have been placed in the Pittsburgh district by Steel car manufacturers, new tonnage is comparatively light in the West, and with few exceptions the mills are well up on their orders. New tonnage in Steel Bars since the recent heavy buying movement has also been comparatively light, but specifications have improved, and the mills are again unable to make shipments in less than four weeks. We quote as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—A heavy buying movement to meet jobbers' requirements is shortly anticipated, as their stocks without exception are exceedingly low, and in many cases are practically depleted. Notwithstanding the high basis prevailing for both Iron and Steel Skelp, there is no indication of an advance in the finished product, and several independent manufacturers have shut down their furnaces until a more profitable basis will prevail. There has been no change in quotations, which are on a basis of 81 per cent. off the list, Pittsburgh, but official discounts on car lots, Chicago, are as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—Specifications on contracts placed at the low prices now prevailing are coming forward more freely, although new tonnage is considerably light, notwithstanding the fact that concessions from the new basis are now

being made by Eastern independent manufacturers. Discounts on base sizes, 2¾ to 5 inches, in car lots, are as follows: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2½-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1⅝ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—Notwithstanding the dearth of large municipal requirements, current orders are heavy, and the tonnage that is being placed with the foundries from week to week is fairly heavy. Shipments on the lighter sizes cannot be made in less than 60 days, although on large Pipe shipments can be made in from four to five weeks. We revise quotations as follows: Water Pipe, 4-inch, $32.50; 6, 8, 10 and 12 inch, $31.50; over 12-inch, $30.50, with $1 extra for Gas Pipe. Large municipal contracts are now being placed on the above basis, and no exception is made by the foundries on the sizes of the purchases.

Merchant Steel.—Practically all of the implement manufacturers have now closed their requirements of special shapes running through the fiscal year from July 1, and specifications for July and August shipments are already coming forward in large volume. Prices are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ inch, 1.81½c.; Iron Finish, 1½ x ½ inch and larger, 1.66½c., base; Channels for solid rubber tires, ¾ to 1 inch, 2.16½c., and 1⅛-inch and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

Coke.—The heavy demand for Furnace Coke is reflected in the strength of the Foundry product and prices are being firmly maintained. Connellsville producers are asking on the basis of $3 at the ovens, equivalent to $5.65, Chicago, and Virginia Coke is quoted at $4.75 to $5. By-Product Coke is also strong and is quoted firmly at $5.65 on contracts, no difference in price being made on small lots for prompt delivery.

Old Material.—The Chicago, Burlington & Quincy Railroad disposed of a list this week of 3500 tons of material, made up largely of Rails and Wrought Scrap. Dealers participated largely in the purchases, as the Iron mills throughout this district are well supplied for several months in the future. Transactions are largely limited to sales and purchases of dealers to cover previous transactions. Cast Scrap continues to be maintained on a basis of $13.50 to $14, and in comparison with other values is on an exceedingly high basis. The curtailed melt of many of the Western foundries has reduced the consumption to a considerable extent, but the outcome from all sources has been exceedingly light during the past two months, and it is due to this fact alone that the present basis of values can be maintained. The range of prices paid by large consumers to producers and dealers, per gross ton, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails	$21.25 to $21.50
Old Steel Rails, 4 feet and over	15.50 to 16.00
Old Steel Rails, less than 4 feet	14.00 to 14.50
Heavy Relaying Rails, subject to inspection, 50 pounds and under	27.00 to 27.50
Old Car Wheels	18.00 to 18.50
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards	13.00 to 13.50
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	22.00 to 22.50
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Railway Springs	13.00 to 13.50
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	11.00 to 11.50
Mixed Busheling	9.00 to 9.25
Iron Axle Turnings	9.50 to 10.00
Soft Steel Axle Turnings	9.00 to 9.50
Machine Shop Turnings	8.75 to 9.00
Cast Borings	7.00 to 7.50
Mixed Borings, &c	7.00 to 7.50
No. 1 Mill	8.50 to 9.00
No. 2 Mill	7.50 to 8.00
No. 1 Boilers, cut to Sheets and Rings	9.50 to 10.00
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00

The Cotton Stalks Products Company is to be formed with a capital of $15,000,000 for the purpose of making paper and denaturized alcohol from cotton stalk fiber. It is predicted that $100,000,000 will be added to the value of the South's cotton crop by the full introduction of the new process.

Cleveland.

CLEVELAND, OHIO, June 26, 1906.

Iron Ore.—The enormous demand for Steel making Irons has caused a heavy demand for Bessemer Ores, and it is possible that some sales will be reported in a short time. The shortage has brought about reports of higher prices and the information that if any Ore was available at the present time there would be little difficulty in getting higher prices. Complaints have been made recently that some Ores now being delivered to the furnaces have not been coming up to the desired analysis. This has tended to advance the price of high grade Bessemer Ores, and it would not be difficult to obtain 25c. to 50c. premium above the contract basis of $4.25, f.o.b. Lake Erie ports, for the best Ores. No sales have been reported recently, principally because the supply is so short, the current demand exceeding the productive capacity of the Old Range mines. The movement down the lakes has been heavy and it is now estimated that the shipments during June will approach 6,000,000 tons, which will establish a new monthly record for the chain of lakes. The interesting part of the present situation is that if the estimated movement for the year is to be realized this record will have to be duplicated several times during the summer and the active movement continued through the fall. Complications are likely to arise when the Coal movement is resumed at a normal gait and it seems impossible now that the lake season shall continue to its close without a certain advance in the carrying charges on wild cargoes. In fact an advance is predicted before the end of July. In fact the demands upon the lake fleet are so heavy and come from such varied quarters this year that it is entirely possible that some rapid advances in wild rates may come before the end of the season of navigation. Even then it is a question whether all demands will be met, especially if the railroads run into a car shortage, which at the present time is threatened. For the time the wild rates remain unchanged, at 75c. from Duluth to Ohio ports; 70c. from Marquette, and 60c. from Escanaba.

Pig Iron.—There is at present a shortage of Foundry Iron in this territory. This is the result of good buying during the past two weeks, the blowing out of some furnaces and the turning of others into the production of Bessemer and Basic. On Monday of last week Cherry Valley furnace went out of blast for repairs, as did also Pickands, Mather & Co.'s furnace at Toledo, which had been running on Bessemer. The same day one of the Foundry Iron furnaces of the Columbus Iron & Steel Company, at Columbus, went out, and on Friday the second one ceased operations. The Hanna Furnace, at Canal Dover, has been running on Bessemer, and continues to do so, and the date for returning to Foundry has not been fixed. These things, with the recent interruption to one of the Hubbard furnaces and to the River Furnace in Cleveland, shortened the supply. On top of this came the demand for Foundry Iron which sprang up in this territory two weeks ago, at the conclusion of the contest between two important interests. Those two concerns had practically sold out at the lower figures, and consequently are now about the strongest factors in the market. A few of the others who had been waiting the termination of this war to fill their own order books are now so thoroughly convinced of the strong position of the market that they are not taking any low priced material. While a few may be willing to supply needs for Iron right now at $16.50 in the valleys the majority are holding for $16.75 in the valleys for No. 2. On the break in Southern Iron prices some of the furnaces in that territory began to come back into this territory, from which they have been excluded for so long. They sold some Iron on the basis of $13, Birmingham, but finding that business came to them so easily began to adopt a different policy, and there is not so much cheap Southern Iron now being offered. Malleable is strong and scarce at $16.75 to $17.25. Small lots of Bessemer are sold at $17.50 in the valleys. Basic is strong at $17 to $17.25 in the valleys. Coke is exceedingly strong, with a good spread of prices. The low mark for 72-hour Foundry Coke is $2.75, at the oven, with the high market at $3.50. Furnace Coke cannot be had under $2.50, at the oven.

Finished Iron and Steel.—To all appearances consumers are able to get a little better delivery on their contracts for Structural Steel, and not so many of them are paying premium and stock prices to fill their needs. The market is strong, however, with some ordering and with specifications against old contracts heavy. Some consumers are still doing business with the jobbers. No new ships have been ordered, according to official announcements, during the past week, but it is understood that one of the big companies has three new ships virtually under contract. The demand for Sheets has been increasing during the past week, and the market has been stronog. The recent rise in the car lot price at the mill has brought about a corresponding advance in some of the grades out of stock. The price on Blue Annealed was not changed, but One Pass and Galvanized Sheets were marked up $2. Prices out of stock in consequence are 2.15c. for No. 10 Blue Annealed; 2.80c. for No. 28 One Pass Cold Rolled, and 3.80c. for No. 28 Galvanized. The market is stronger also for Bar Iron, and it is pos-

sible that the low price recently prevailing will end in a short time. Mills in this territory which will close July 1 for repairs announce that they will be idle for only a week. There is a good deal of buying of Steel Bars also at the old price of 1.50c., Pittsburgh, for Bessemer and Open Hearth. The demand is said to indicate that the covering on the recent temporary reduction was not as heavy as at first supposed. Supplementary orders are, therefore, being placed at the current price. The increase in the demand for the finished material and also in the productive capacity of the same has tended to increase the already extraordinary demand for Billets, with the result that the supply is still short and the prices high. Forging quality are selling at $35, Pittsburgh.

Old Material.—The increased demand for Bar Iron is likely to bring about better buying of Scrap. Anticipating the shut down in July for invoice the mills have not been buying freely of late. The prices have not changed, and the following are dealers' prices to the trade, f.o.b. Cleveland, gross tons: Old Steel Rails, $14.50 to $15; Old Iron Rails (nominal), $21 to $22; Iron Car Axles (nominal), $18.50 to $19.50; Heavy Melting Steel, $14.50. Net tons: Cast Borings, $8.50 to $9; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $16; No. 1 Cast, $14 to $14.50; Iron and Steel Turnings and Drillings, $9.50 to $10.50.

Pittsburgh.

PARK BUILDING, June 27, 1906.—(*By Telegraph.*)

It is understood that negotiations are on with several of the large Steel interests, including the United States Steel Corporation, for the purchase by these concerns of large tonnages of Bessemer and Basic Iron for delivery in the third quarter and that some of these negotiations will be consummated possibly before this week is out. The market on Steel making Irons is very firm, and Bessemer and Basic Irons for delivery prior to August are exceedingly scarce. We quote Standard Bessemer Iron for July delivery at $17.75, Valley furnace, and for third quarter delivery at $17.50, Valley furnace. We note sales of 4000 tons of Standard Bessemer for July, August and September delivery at $17.75, Valley furnace; 3000 tons of Standard Bessemer for delivery commencing September at $17.50, Valley furnace, this Iron going to a local interest; 4000 tons of Standard Bessemer to another consumer for third quarter delivery at $17.75, Valley furnace, and 500 tons for July delivery at $17.75, Valley furnace. Basic Iron is very firm and somewhat scarce at $17, Valley furnace. There is more inquiry for Foundry Iron and Foundries that have contracts are urging the furnaces to make prompt shipments, thus showing that the amount of Iron piled in the yards of the foundries is very light. We quote Northern makes of No. 2 Foundry at $16.25 to $16.50, Valley furnace, but note that some furnaces might shade this price on desirable tonnage about 25c. a ton. We note a sale to a local consumer of 500 tons of No. 2 Foundry on the basis of $16, Valley furnace, and 500 tons of No. 3 to the same interest on the basis of $15.50, Valley furnace. This Iron was sold by a local producer. Forge Iron is very quiet, and we quote Northern makes at $15.50, Valley furnace, or $16.35, Pittsburgh.

Steel.—The shortage in the supply of Bessemer and Open Hearth Billets seems to be getting worse, and Steel is very hard to obtain at any price. Bessemer Billets are very firm at $27 to $27.50, while Open Hearth Billets readily command $28 to $29, Pittsburgh. We quote Sheet and Tin Bars in random lengths at $29, Pittsburgh, for delivery commencing July 1, an advance of 50c. a ton being charged for Cut Bars.

Steel Rails.—Orders taken by the Carnegie Steel Company during the week include 12,500 tons to the Minneapolis, St. Paul & Sault Ste. Marie for next year's delivery, and 4300 tons to the Winona Interurban Traction Company for this year's delivery.

(*By Mail.*)

The past week has been quiet, the tonnage placed in Finished Iron and Steel having been somewhat smaller than in the week previous. This is the season when a lull usually occurs in the Iron trade and this year promises to be no exception. It is believed that July and August will show a falling off in tonnage, but with the heavy contracts on the books of the mills there will not be any cessation of work longer than is absolutely necessary for stock taking and making needed repairs. The output of Bessemer and Basic Iron prior to September 1 is practically all under contract, and Steel making Irons will probably be scarce and firm in price during July and August.

Ferromanganese.—With more inquiry for Ferro for prompt shipment higher prices are being quoted. Foreign 80 per cent. Ferro is held at about $75, Pittsburgh, for July delivery, and we note a sale of 50 tons at that price. For third quarter delivery $80 to $83 is quoted.

Muck Bars.—There is no inquiry, and we quote best grades of Muck Bar made from all Pig Iron at $28 to $28.50, Pittsburgh.

Wire Rods.—Inquiry is moderate, and owing to scarcity and high prices of Bessemer and Open Hearth Billets, prices on Rods are firm at $34, Pittsburgh.

Skelp.—The market continues very quiet, and we do not hear of any sales. Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—No important contracts have been placed in this district lately, but some large work is in the market, including 1200 tons for an Open Hearth Steel plant. The leading Structural interests are full of work, and labor troubles are interfering more or less with some contracts now under way. Prices are firm, and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.70c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—We note a considerably better demand for Plates, and the mills have more tonnage on their books at this time than at any period in the past month or six weeks. Universal Mill Plates are hard to obtain for delivery inside of a month or six weeks, and some users are using narrow sizes of Sheared Plates, on which the mills can make slightly better deliveries. Capacity for rolling narrow sizes of Plates promises to be considerably increased within the next year. Prices are fairly strong, but are sometimes shaded to the extent of $1 to $2 a ton on the narrow widths. We quote: Tank Plates, ¼-inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—We note a continued heavy demand for Black and Galvanized Sheets, and most of the mills are unable to promise deliveries on new business inside of a month or six weeks or longer. Stocks held by the large trade are light, so that Sheets are going into actual consumption practically as fast as turned out by the mills. The scarcity of Sheet Bars is getting worse, and some of the mills are suffering a good deal for lack of Steel, and are not able to run full time. The market is very firm, and we quote: Nos. 10 and 12 gauge, 2.10c.; Nos. 13 and 14, 2.15c.; Nos. 15 and 16, 2.20c.; Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.65c., and No. 30, 2.75c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.80c., and No. 30, 4.05c. We quote No. 28 Gauge Painted Roofing Sheets at $1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $3.10 per square for 2-inch corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Iron and Steel Bars.—Additional heavy tonnage in Steel Bars has been booked by the Carnegie Steel Company and other concerns, and the tonnage on the books of the mills is now larger than for some time. It is understood that for prompt deliveries of Steel Bars some mills are quoting an advance over the official price of about $2 a ton. New tonnage in Iron Bars is not satisfactory to the mills, but is picking up to some extent. A good many plants that roll Bars will close down about July 1 for inventory and repairs. We quote: Iron and Steel Bars at 1.50c., base, half extras, for carloads and larger lots.

Hoops and Bands.—A fair amount of new tonnage is being placed at the full official price, but the mills rolling Hoops and Bands are running mostly on specifications on contracts, which continue to come in quite freely. We quote Steel Hoops at 1.90c. and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail

rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—Only a small amount of new business is being placed, but the mills are filled up on contracts on which heavy shipments are being made and which will keep them running to full capacity for some months ahead. There is still a great scarcity of Tin Bars, which are very hard to obtain even at the new price of $29 for random lengths, which will be effective July 1. It is expected that a number of independent Tin Plate mills will close July 1 for inventory and repairs, and may possibly remain idle for some little time, as their wage scale with the Amalgamated Association has not yet been arranged. We quote Tin Plate at $3.75 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in ten days, on which price a rebate of 5c. a box is allowed for carloads and larger lots.

Railroad Spikes.—Demand for Railroad Spikes is heavier than ever before known in the history of the trade, two of the local makers being practically out of the market, as they have all the orders they can take care of for the next two or three months or longer. Prices are very firm, $2.15 being absolutely bottom of the market, while some makers are holding Spikes at $2.20 to $2.25, Pittsburgh, for the best sizes and will not shade these prices under any conditions.

Merchant Steel.—No changes were made in prices of Shafting at the meeting of the Shafting Association held in Niagara Falls, N. Y., on Wednesday, June 20. The market on Shafting is steadier now than for some time; prices in main are being firmly held. It was decided not to adopt a free price in cents per pound, as was suggested by one or two of the makers. Prices are firm but unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., and 1⅛-inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Merchant Pipe.—None of the contracts for 4-inch to 12-inch line Pipe, referred to in this report last week, have been placed. Bids on these gas lines, which call for about 108 miles, have been sent to Kansas by the mills, and contracts are expected to be awarded in a short time. General demand for Merchant Pipe continues very active, and the mills have a very large tonnage on the small sizes and also on the larger sizes on their books, being filled up for the next two or three months. Prices are unchanged, the extreme discount on Merchant size of Steel Pipe remaining at 81 and 5 per cent. off to the large trade. Official discounts for carloads, which continue to be shaded one point or more, are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	%	%	%	%
⅛ and ¼ inch	72	56	60	53
⅜ inch	74	60	71	57
½ inch	76	64	73	61
⅝ to 6 inches	80	70	77½	67½
7 to 12 inches	75	60	72½	57
Extra strong, plain ends:				
⅛ to ⅜ inch	65	53	62	50
½ to 4 inches	72	60	69	57
4½ to 8 inches	68	56	65	53
Double extra strong, plain ends:				
½ to 8 inches	61	50	58	47

Boiler Tubes.—We note a continued heavy demand for Locomotive and Merchant Tubes, the mills being filled up for the next several months. Discounts as adopted by the leading mills some time ago are being maintained. These are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	45	50
1¾ to 2¼ inches	45	62
2½ inches	50	64
2¾ to 5 inches	57	70
6 to 13 inches	45	62

Iron and Steel Scrap.—The Scrap trade continues very quiet, sales being mostly for carload lots, none of the large consumers being in the market. The Scrap trade is likely to continue quiet during July, as many of the mills were closed down early in that month for needed repairs and stock taking. Heavy Steel Scrap is firmer than anything else on the list. We quote: Heavy Steel Melting Scrap, $15.50; Bundled Sheet Scrap, $13.75 to $14.00; No. 1 Wrought Scrap, $17.25 to $17.50; Machinery Cast Scrap, $15.50; Cast Iron Borings, $8.25 to $8.50; Old Steel Rails, short pieces, $15.50 to $15.75; Old Steel Rails, rerollers, $17.25 to $17.50; Axle Turnings, $12.50; Stove Plate, $10.25 to $10.50; Wrought Turnings, $11.50 to $11.75; all in gross tons f.o.b. Pittsburgh. We note a sale of Locomotive Axles at $32 per net ton, Pittsburgh.

Coke.—Demand for Furnace Coke is much better and prices are firm and higher. The Lackawanna Steel Company has bought 50,000 tons of Furnace Coke for shipment to its blast furnaces at Buffalo, N. Y., deliveries running over balance of the year. We quote strictly Connellsville Furnace Coke at $2.40 to $2.50 a ton at oven. We quote best grades of 72-hour Foundry Coke at $2.65 to $2.75 a ton at oven. Output of Coke continues very heavy, the upper and lower Connellsville regions having made 376,690 tons last week. The Thompson-Connellsville Coke Company will build 800 ovens at Merrittstown, in the Connellsville region.

Philadelphia.

REAL ESTATE TRUST BUILDING, June 26, 1906.

The feeling in the Iron trade is somewhat unsettled. Prices are just about as they were a week ago, but the volume of business is light, buyers being inclined to defer buying for forward delivery. The situation is certainly a peculiar one and one that cannot be gauged with exactness. In some respects the market looks strong, yet there is an undertone of feeling that betokens considerable doubt as to the final outcome. Pig Iron for July and August delivery is held at firm prices, simply because stocks are light and for the months named furnaces are fully sold ahead; consequently there is no reason whatever for lowering prices. The great problem, however, is in regard to the later months, which seem to be clouded with uncertainty. No great effort has been made to establish a basis of prices for the later months of the year, makers having no stocks to bother them, besides being fairly well provided with orders until the last quarter, under which circumstances it would be poor policy to force material on unwilling buyers. From the buyer's standpoint, however, there is no special inducement for them to place orders in advance of requirements. The weakening in Southern Irons is not suggestive of favorable conditions, and while it has had little or no influence in this territory thus far, yet it has certainly made consumers more disposed to expect lower rather than higher prices. Business is not bad in any department, but there is no such buoyancy as there was a year ago, and in many respects prospects are less favorable than they were then, besides which prices average about a dollar per ton higher, while the capacity for production is greater than at any previous time. The unwillingness to buy for long delivery is, therefore, quite natural, but as already stated the market has not had a fair test as regards prices for the later months, although every day will begin to clear away the prevailing uncertainty.

Pig Iron.—The market is so many sided that it is almost impossible to diagnose it correctly. Anything wanted for delivery within 60 or 90 days commands full prices; anything for later dates is almost entirely neglected. The question appears to be whether buyers or sellers will be the first to break the ice. Both occupy a fairly good position, and for that reason neither side has any immediate reason for changing its attitude. The reduction in prices made last week by the Southern furnaces seems to favor the buying side, but it is claimed that they have no great surplus to spare, and that the amount they can furnish to Northern markets will not be important. But the fact that they made the reduction indicates that they expect to have some Iron to spare, which will necessarily interfere more or less with Northern Irons. Then again the fact that the cost would be 50c. to 75c. less than local Irons cannot be regarded as a bull argument on the latter, especially as consumers are not willing to place orders for forward delivery at to-day's figures. To say that prices will be either higher or lower within the next 30 days would therefore be a guess pure and simple, but the preponderance of evidence is certainly not in favor of higher prices. Buyers are not likely to take an aggressive position at this time. Whether sellers will follow the Southern furnaces is also an open question, and will depend a good deal on what tonnage they will have to compete with. Under such conditions it is rather likely that a dull, heavy market will continue for the present, but some time in July the trend of the market will no doubt be pretty clearly indicated. The amount of business done during the week is by no means inconsiderable, but it is all for deliveries during the third quarter, for which prices similar to those of last week were obtained. This includes No. 2 X Foundry at $18.25 to $18.50, No. 2 Plain at $17.50 to $17.75, Gray Forge at $16 to $16.25 and Basic at $17.50. A sale of 5000 tons foreign Low Phosphorus was also made at a figure estimated at a little better than $23, on dock, duty paid. A 1000-ton lot of domestic also sold at about $23.25, f.o.b. local furnace, and a few small lots of foreign to arrive in a few days at about $24.50, delivered to local foundries. There is little or no demand for the last quarter, however, and prices for such deliveries would probably be 25c. to 50c. less than the usual quoted rates, which are about as follows:

No. 1 X Foundry	$19.00 to $19.25
No. 2 X Foundry	18.25 to 18.50
No. 2 Plain	17.50 to 17.75
Standard Gray Forge	16.00 to 16.25
Ordinary Gray Forge	15.75 to 16.00

Basic	17.50 to	17.60
Low Phosphorus	24.50 to	24.75
Malleable	18.75 to	19.00
Bessemer	19.85 to	20.00
Lake Superior Charcoal	21.50 to	22.50

Steel Alloys.—The market maintains a strong undertone, and while buyers are not able to shade last week's prices they are reluctant to pay the advance unless for material that is wanted for immediate use. Prices are a little irregular, but holders ask $90 for July Ferro and $72.50 to $75 for the last quarter; 12 per cent. Ferrosilicon, $35 to $36; Spiegeleisen, $31 to $32.50.

Steel.—There is a good demand for Billets, both for ordinary Open Hearth and for Forging Steel. Prices are steady at last week's prices—viz., $29 for ordinary Open Hearth and $32 to $33 for Forging Steel.

Plates.—Business has been more active during the past week, and mills will close the month with more business on their books than at the beginning. The 6000 tons of Plates for Riveted Pipe will be supplied from Pittsburgh under an old agreement. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Extra per 100 pounds.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00

Structural Material.—Apart from the run of small and medium sized orders there is nothing notable in this district. The aggregate tonnage is quite important, but mills are in good shape for handling it, so that deliveries can be given without much delay when so required. Prices are unchanged, as follows: Beams, Angles and Channels, 1.83½c. to 2c., delivered.

Bars.—This is the dullest end of the Finished Material trade, and there does not seem to be much prospect of improvement until after the midsummer holidays. Production will be limited for awhile, however, and by the time that work is resumed it is hoped that a good deal of business will have filtered through, but for the present buyers seem to be perfectly indifferent. Prices for Best Refined Iron and for Steel remain at 1.63½ to 1.68½c.

Old Material.—There is practically no demand at the present time, although at a price something might be done for deferred deliveries. The mills have their yards so crowded that they buy nothing for immediate delivery, and in many cases ask that shipments on old contracts may be kept back until they can get their yards cleared. Prices are hardly quotable, but the following would be a fair average of bids and offers delivered in buyers' yards:

Scrap Steel Rails and Crops	$16.00 to	$16.25
No. 1 Steel Scrap	15.75 to	16.00
Low Phosphorus Scrap	20.00 to	21.00
Old Steel Axles	18.50 to	19.00
Old Iron Axles	25.00 to	25.50
Old Iron Rails	20.00 to	20.50
Old Car Wheels	16.75 to	17.25
Choice Scrap, R. R. No. 1 Wrought	17.50 to	18.00
Choice No. 1 Yard Scrap	16.00 to	16.50
Long and Short	15.00 to	15.50
Machinery Scrap	15.00 to	15.50
Wrought Iron Pipe	12.50 to	13.00
No. 1 Forge Fire Scrap	13.50 to	13.75
No. 2 Light Ordinary	10.00 to	11.00
Wrought Turnings	12.00 to	12.50
Axle Turnings, Choice Heavy	12.75 to	13.25
Stove Plate	11.00 to	11.50
Cast Borings	9.25 to	9.50

Birmingham.

BIRMINGHAM, ALA., June 25, 1906.

Pig Iron.—The past week has been the most active for many months in this district, it being estimated by a well posted Iron man that sales aggregating 100,000 tons have been made. The termination of the understanding between Southern manufacturers having expired by limitation, it having been entered into for only 60 days, was a signal for concessions by all producers, and the price was at once cut by some to $13, while others have been holding for $13.50 for No. 2 Foundry. One prominent concern reports the sale of 22,000 tons at $13.50, and states that it refused 40,000 tons at $13. The promptness with which buyers responded to the concessions has been very gratifying to producers and has already had the effect of strengthening the market. Numerous inquiries are being received, and those who made the largest cut are seemingly ready to stand for better prices. It is understood that Southern melters will not enjoy the benefit of the decline, but that an agreement has already been entered into, or will be shortly, to hold the price at a figure which in all probability will not be less than $13.50. It is also intimated that steps will be taken at once to prevent demoralization of the market.

The Sloss-Sheffield Steel & Iron Company and the Alabama Consolidated Coal & Iron Company will each put another stack in blast this week on Foundry Iron, increasing production by about 400 tons daily.

Cast Iron Pipe.—Ordinarily a decline in Iron affects the Pipe market, but in this instance it has had no effect whatever. The price now is not governed so much by the cost of the raw material which enters into its manufacture, but almost entirely by the supply and demand, and as the demand is the greatest for years the Pipe people are making their own prices. Owing to the heavy bookings and the inability of many foundries to furnish certain sizes no very definite idea of prevailing prices can be given, but the following quotations are understood to be approximately correct on Water Pipe: 4 to 6 inch, $27.50 to $28; 8 to 12 inch, $27 to $27.50; over 12-inch, $25.50. Gas Pipe, $1 per ton extra.

Old Material.—The Scrap market has been very dull this week, with practically nothing done. The decline in Pig Iron has had its effect and prices have been marked down from 50c. to $1 per ton. Dealers' quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$18.50 to	$19.00
Old Iron Axles	18.00 to	18.50
Old Steel Axles	16.00 to	17.00
Old Car Wheels	16.50 to	17.00
No. 1 Railroad Wrought	15.50 to	16.00
No. 2 Railroad Wrought	15.00 to	15.50
No. 1 Country Wrought	13.00 to	13.50
No. 2 Country Wrought	11.00 to	11.50
Wrought Pipe and Flues	11.50 to	12.00
Railroad Malleable	12.00 to	12.50
No. 1 Steel	12.50 to	13.00
No. 1 Machinery Cast	11.00 to	11.50
Stove Plate and Light Cast	8.50 to	9.00

The United Mine Workers, who have been in session here for the past two weeks, have signed a contract with the Alabama Consolidated Coal & Iron Company for another year, beginning July 1, and it is understood the differences with the Commercial Operators have been adjusted and contract will be signed within the next few days. These contracts are in all essential respects the same as that under which the miners have been working for the past three years, and are on a sliding scale of prices. The Alabama Consolidated is the only furnace company in the district employing Union miners, all other Iron producers here working their mines on the open shop plan since the strike two years ago.

Cincinnati.

FIFTH AND MAIN STS., June 27, 1906.—(*By Telegraph.*)

Pig Iron.—The flurry brought about by the disintegration of the Southern combination has not yet fully passed away. The effect of this action has been to increase greatly the uncertainty of prospective buyers as to the outcome and has left them in serious doubt. It is said that one or two large consumers took advantage of the temporary decline to cover for early requirements, but even they have not had the assurance to cover for the remainder of the year's supply. It looks as though the end was not yet, and while Southern prices are lower than last week there is a flexibility about them that causes much suspicion. From all reports received $13, Birmingham, for No. 2 is the market, yet we learn of sales below this figure. Several of the large Southern producers are holding for $13.50, while others are quoting $13. It is very apparent, however, that the sales made on a $13.50 basis are very restricted and that $13 or less is taking the bulk of the business offered. This, as intimated above, is not coming forward in any considerable volume and the tendency to wait for further recessions continues. One of the large agricultural concerns that was supposed to have bought a large tonnage is now reported to have merely covered for immediate emergencies, and apparently is manifesting very little interest on the situation as it is at present. Northern Irons are holding quite strong, reports indicating that a number of the furnaces are well sold up for some months to come. There is an inquiry for 1000 tons of Gray Forge from a central Ohio consumer, and a sale of about 2000 tons to a southern Ohio melter, which rumor says went below $13, Birmingham. A large melter in northern Ohio is said to have bought about 15,000 tons and will probably be in the market for as much more this week. Freight rates from the Hanging Rock district to Cincinnati are $1.15 and from Birmingham $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$16.50 to	$17.00
Southern Coke, No. 2	16.00 to	16.50
Southern Coke, No. 3	15.50 to	16.00
Southern Coke, No. 4	15.00 to	15.50
Southern Coke, No. 1 Soft	16.50 to	17.00
Southern Coke, No. 2 Soft	16.00 to	16.50
Southern Coke, Gray Forge	14.75 to	15.25
Southern Coke, Mottled	14.25 to	14.75
Ohio Silvery, No. 1 (8 per cent. Silicon)	21.65 to	22.15
Lake Superior Coke, No. 1	17.65 to	18.15
Lake Superior Coke, No. 2	17.15 to	17.65
Lake Superior Coke, No. 3	16.65 to	17.15
Car Wheel Irons.		
Standard Southern Car Wheel	$24.00 to	$24.25
Lake Superior Car Wheel	22.50 to	22.75

Coke.—There is no great amount of activity, but trade is normal and prices holding firm. Several large contracts were closed during the week, and general conditions are quite satisfactory. We quote the best brands of Connellsville and Virginia Foundry at $2.75 to $2.85, f.o.b. ovens.

Finished Iron and Steel.—There is practically no change in the situation. Bar Iron continues to show considerable activity, and prices are firm. Structural Shapes and Plates are possibly not so active as some weeks since, but the volume of trade is ample to consume the product of the mills. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ inch or heavier, 1.83c., in carload lots.

Old Material.—The market is quiet, and dealers are complaining. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $14 to $14.50 per net ton; Cast Borings, $5 to $6 per net ton; Steel Turnings, $7 to $8 per net ton; No. 1 Cast Scrap, $12 to $13 per net ton; Iron Rails, $19 to $20 per gross ton; Steel Rails, rolling mill lengths, $14 to $15 per gross ton; Relaying Rails, 56 lbs. and upward, $28 to $29 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $17 to $18 per gross ton; Low Phosphorus Scrap, $18 to $19 per gross ton.

The German Iron Market.

BERLIN, June 14, 1906.

Some preliminary statistics of Germany's foreign trade for May throw a strong light upon conditions in the country's Iron and Coal trades. As intimated in previous letters, German Iron mills have been compelled to turn to England to supplement their stocks of Iron. The imports of Pig Iron for May rose to 28,620 tons, as compared with 25,790 tons in April (only 11,700 tons in March); whereas exports of Pig dropped from 38,420 tons in April to 34,028 tons in May. The same tendency is shown in the movement of Iron Ores, imports of which increased from 634,800 tons in April to 698,400 tons in May, while exports sank from 317,700 tons to 306,100 tons. A parallel movement took place in Coal, though here the drop in exports was much more striking. Imports of Coal rose from 736,600 tons to 784,200 tons, and exports fell from 1,504,500 tons to 1,419,200 tons. All accounts agree that there has never been such a pressure in the German market to buy Iron and Coal.

The Fuel Situation of First Importance.

At this moment conditions in the Coal trade are occupying, if possible, still greater attention than in the Iron trade. Coal has become scarce; some reports even assert that a famine is at hand. It appears that production has been reduced through several causes. The supply of cars remains insufficient. A car famine in the spring is something new in the German Coal industry, that experience having hitherto been confined to the autumn months, when the agricultural districts are making unusually large demands for cars. Shipments by rail in May, however, show a pretty good increase over 1905. The movement of Coal, Coke and Briquettes by rail amounted to 8,039,000 tons in May, as against 7,672,000 tons in May, 1905. The production of the country for May has not yet been tabulated, but that for April showed a drop of about 2,300,000 tons as compared with March. The shrinkage for April was explained as due chiefly to the shortness of the month and the number of holidays; but there is another cause which is still operative—the scarcity of miners. As usually happens in times of great activity in the Iron trade, miners are being attracted to the better paid work of the furnaces and Steel mills. Others have been mustered in for military service, and even the miners at work are producing less coal per capita than usual.

Under these circumstances most of the Coal companies are not able to mine more than about 85 per cent. of their allotments in the Syndicate. In order to make up for the deficiency of Coal the Syndicate some weeks ago asked the Hamburg-American and other steamship companies it supplies to buy bunker Coal in England upon its account. The Syndicate has been forced to restrict its export business. Consumers of German Coal in Holland have been compelled to turn to English Coal. Coke is in enormous demand and the coking plants are struggling to their utmost to meet it, but they are also in part hampered by lack of laborers.

Syndicate Mills at High Pressure.

At a meeting of the Steel Verband at Düsseldorf to-day an increase of 10 per cent. in the allotments in Plates, Car Axles and certain other material was voted, also an increase of 5 per cent. in Piping. The monthly report of the Verband says that the works are rushed to an extraordinary degree. The shipments in May were only slightly less than those of March, which is the record month; but shipments per workday in May were actually heavier than in March. In half-rolled material the home demand is growing day by day more pressing, and the works can scarcely meet their contracts. Numerous inquiries for the fourth quarter are already in hand. The foreign market is firm. As already reported, the Verband some time ago suspended accepting foreign orders for half-rolled materials for the third quarter of the year in the interest of home consumers. Foreign orders for the fourth quarter, says the report, are being accepted only to a limited extent, and on these the prices fixed are in nearly all cases equal to home prices. In railroad material the works have full employment to the end of the year. The demand from Germany is particularly heavy, but the lively pace in the foreign market continues. Inquiries for Rails, &c., are coming in in great numbers. Large contracts are being taken at good prices, and still greater quantities could be contracted for if the wishes of buyers could be met as to delivery. In Structural Material there is an increase of shipments and specifications, and the May shipments were the heaviest yet reached. The amounts recently sold for the third quarter were placed at higher prices, but these sales were kept within normal limits, in order to counteract any tendency toward speculation. This year's building season promises to turn out very satisfactorily.

Price Advances Less Frequent.

Price advances in the Iron trade are now less frequent than a month ago, which is perfectly natural in view of the general upward movement in May. An upward revision on finished goods, however, has been made in all cases where it was found possible, in order to compensate for the higher prices of raw materials. All branches of the trade remain in a state of prodigious activity, which is only lessened in some cases by lack of Coal. The scarcity of Pig Iron has not been abated, and there is but slight prospect that it will be relieved soon. New furnaces, however, are under construction which will add from 800,00 to 1,000,000 tons a year to the country's production, and that additional amount ought to meet all demands for some time to come. The sale of Pig Iron of all grades has been declared open to the middle of 1907.

The recent abolition and reduction of export bounties by Coal, Iron and Steel producers has caused so much discontent among establishments working for the export trade that an effort is to be made to have the bounties restored to their old basis. A conference of the interests affected has been called for an early day, when the whole matter will be fully discussed. No indication is at hand as to what action will be taken.

The Renewal of Syndicates.

Much attention has been given of late to the question of renewing trade organizations. The Düsseldorf Pig Iron Syndicate has just been prolonged for two years, and the Siegen Syndicate is to run another three years from July 1, since none of its members have expressed a wish for its dissolution. Efforts toward the renewal of the Wire Nail Syndicate have been in progress for some weeks, but the result remains in great doubt, it being very difficult to harmonize the demands of several establishments with the general interests of the trade. Chief attention, however, is given to the prolongation of the great Steel Verband, which is already under negotiation, although the organization does not expire before the end of June, 1907. Much difficulty attends these negotiations, owing to the fact that the attempt to fix allotments for the production of goods other than half-rolled Steel, Structural and Railway Steel meets with great inherent obstacles. A motion, however, has been made to prolong the Verband for another year, and this will doubtless be done in due time, if a longer period is not meanwhile agreed upon.

Metal Market.

NEW YORK, June 27, 1906.

Pig Tin.—A sentiment seems to prevail in the entire Metal trade against higher prices, and it has undoubtedly influenced quotations to some extent. No large amount of business has been transacted at lower quotations and stocks are now so small that if any heavy buying should set in prices would probably be forced upward. The market has been exceedingly dull. On Thursday of last week, in fact, it was practically out of the question to secure any accurate quotation. On Friday, however, Tin was sold at 39.45c., which was also the high price for the week. On Monday the London market declined £2, which was followed by a decline of 60 points in this country, or to 38.85c. On Tuesday a further decline in the London market was such that Tin sold at 38.60c. The statistical position tends to favor consumers slightly, as Tin is now going into store and none coming out. The arrivals aggregate 2996 tons, which include a cargo of 325 tons on the Minnehaha and 10 tons on the Amsterdam. The afloats are about 2600 tons. It is believed that figures for this month will show increased stocks in store despite the apparently light arrivals. Yet there are some heavy shipments scheduled both from London and East, due the early

part of next month. The London market has advanced slightly from last week's price of £175 5c. to £176 10s. for spot and £176 for futures. Tin can be obtained in New York to-day at 38.75c.

Copper.—The lower prices for standard warrants in London are responsible for a weakness in this market, and we quote spot and nearby Lake at 18.62½c. to 18.87½c., futures being obtainable at 18.62½c. to 18.75c. Spot Electrolytic can be had at 18.62½c. and futures at 18.50c. Casting grades are unchanged and for all deliveries and brands 18c. to 18½c. is quoted. The London market to-day is lower at £81 15s. for spot and £80 15s. for futures. No sales of any moment have been recorded, either in this country or in Europe. Consumers are fairly well supplied with metal for some time to come, and producers are not accumulating stocks. Reports from the Arkansas district are that the output during May was a record breaking one at Douglass. The leading producer in that district is contemplating erecting a new concentrating mill, to cost in the neighborhood of $1,000,000, which will be needed to take care of the increased Ore coming from new openings. The total exports until Monday of this week aggregate 15,877 tons, which compares more than favorably with previous months of this year.

Pig Lead.—The market is a trifle easier, spot Lead being obtainable in New York at 5.87½c. to 5.90c. The scarcity has been relieved by recent arrivals of foreign Lead, consequently the premium over the American Smelting & Refining Company's quotation of 5.75c. is lessened. This company is only accepting orders at the present time at prices current on date of shipment, the above price governing old contracts. In St. Louis the market is also easier at 5.82½c. The London market has declined slightly and closes at £16 12s. 6d.

Spelter.—The good business of a fortnight ago has practically disappeared, and the market has relapsed into its customary lethargy. The metal can be obtained in New York at 6.05c. to 6.15c. In St. Louis the market is easier at 5.97½c. The London market is also slightly lower at £27.

Quicksilver.—There is no change, flasks of 75 pounds in 100-flask lots being sold at $41 per flask, with the customary differentials for jobbing and export lots.

Antimony.—Cookson's & Hallett's are freely sold at 24c. to 25c.; other brands at 23c. to 24c. There is considerable unevenness to the market, as has been the case for some time past.

Nickel.—The market is unchanged, large lots being held at 45c. to 50c.; smaller quantities at 50c. to 65c.

Tin Plate.—There is little new business now being recorded in Tin Plate, and the Terne Plate trade is exceeding dull. There continue to be a number of mills idle, owing to the scarcity of Tin Plate Bars. For 100-lb. IC Coke Plates $3.94 is quoted, f.o.b. New York, and $3.75, f.o.b. Pittsburgh.

Old Metals.—The easing in quotations for Ingot Copper does not appear to have affected the market for Old Metals and we continue to quote selling prices for Scrap as follows:

	Cents.
Copper, Heavy Cut and Crucible	18.00 to 18.25
Copper, Heavy and Wire	17.75 to 18.00
Copper, Light and Bottoms	16.00 to 16.25
Brass, Heavy	12.50 to 12.75
Brass, Light	10.50 to 10.75
Heavy Machine Composition	16.50 to 17.00
Clean Brass Turnings	11.50 to 11.75
Composition Turnings	13.50 to 14.00
Aluminum Scrap	26.00 to 28.00
Lead, Heavy	5.45 to 5.60
Tea Lead	5.20 to 5.35
Zinc Scrap	4.90 to 5.00

New York.

NEW YORK, June 27, 1906.

Pig Iron.—Quite a considerable number of sales of lots of 500 to 1000 tons have been made during the past week, including lots by Tennessee makers, who have an advantage of 25c. to 50c. in freights, as compared with producers in the Birmingham district. Some business has also been done by Buffalo furnaces. The Lehigh and Schuylkill makers are not freely meeting the competition of the Southern furnaces, because they are well booked up for the near future, to which buying is limited. The Steel Corporation has bought from 8000 to 10,000 tons for the Pencoyd Works. We quote Northern Pig Iron, No. 1, $18.50 to $19; No. 2 Foundry, $17.75 to $18.25, and No. 2 Plain, $17.25 to $17.75. Southern Iron is quoted $18.25 to $18.50 for No. 1, and $17.25 to $17.50 for No. 2.

Steel Rails.—The market continues active, for delivery during 1907, among the sales made during the last week having been 4000 tons to the Cairo & Thebes, 11,500 tons to the Norfolk & Western, 5000 tons to the Central Railroad of New Jersey, 10,000 tons to the Wabash and 12,500 tons to the Delaware, Lackawanna & Western. The Northern Electric Company of San Francisco has ordered 2950 tons for 1906 delivery and 6000 tons for 1907 delivery. The Grand Trunk Railway has contracted for 5500 tons for use in the United States this year, and the Olean Street Railway has been entered for 2000 tons for this year. Export sales, for shipment in December and January, figure up 35,000 tons, the greater part for Mexico. Other business for South America and Japan is pending and may be put through. It is not expected that our mills will participate in the Canadian business. It is reported that the Lake Superior and Dominion companies will share the 65,000-ton order from the Grand Trunk Pacific, and that the Dominion Company has taken 50,000 tons for the McKenzie-Mann road. The Temiskaming & Ontario road is reported to be in the market for a large tonnage.

Structural Material.—Railroad bridge work has been the chief factor in the past week. The Southern Railway is in the market for 8000 to 9000 tons, and various bridge contracts just let, largely taken by independent fabricating companies, amount to 9000 or 10,000 tons. The largest single contract was 2950 tons for the Erie system, taken by the American Bridge Company, this being in addition to important Erie work let some time ago. The new Hoffman House, calling for 1500 tons, goes to the Thomson-Starrett Company. The National Museum at Washington, 2500 tons, will be built by the American Bridge Company, which is now making the record output of about 55,000 tons a month. The mills are making better deliveries and the situation, in spite of strikes, is generally satisfactory. We quote on tidewater deliveries the following prices for shipments from mills: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 inches the extra is 0.10c., and on Angles over 6 inches, 0.10c. Beams and Channels out of stock are sold at 2½c.

Bars.—In Steel Bars some little buying has been reported in the past week, where contracts expire with the middle of the year. Some stimulus has evidently been given the market by the recently reported large contracts in the West. The Eastern Bar Iron manufacturers held a meeting in the past week and canvassed the situation. No change in prices was made, and there is in some quarters more of a disposition to maintain a parity with Steel. In view of the midsummer shutdown present conditions are expected to be maintained in July. Steel Bars continue at 1.64½c., tidewater, which is also the official price for Bar Iron.

Plates.—The local demand continues light. On Universal Mill Plates sellers are booked farther ahead than on Sheared Plates, in view of the continued good demand for structural purposes, but Sheared Plates have improved somewhat in the week. Shipyard demand shows some increase over recent months. There are occasional reports of shaded prices on Plates, but these seem to be made by mills rolling the narrower widths and are said to emanate from the Central West. We repeat quotations at tidewater, as follows: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., acording to specifications.

Cast Iron Pipe.—No large contracts are being figured on in this territory, the only Eastern business of moment being a contract for 3229 tons of Pipe for Philadelphia filter work, let to a company in that city. The demand from general sources, particularly for Water and Gas Pipe, for extensions in municipalities around New York City and for work consequent upon real estate operations, keeps up at the full volume of recent weeks. Most of the foundries are booked through the third quarter, and it is understood that the Southern foundries more recently entering the market have good orders in hand. We continue the quotation of $32 per net ton, at tidewater, as a price which could readily be secured on early deliveries of 6-inch Pipe in carload lots.

Old Material.—The market is at a standstill so far as Iron rolling mill Scrap is concerned. Labor settlements are at hand for a portion of the Eastern mills, and the midsummer shutdowns. While some business could be done at concessions, dealers able to carry large stocks are not disposed to lower recent prices. In Foundry Scrap business is light, but prices are maintained. We continue quotations, as follows, for New York and vicinity:

Old Iron Rails	$19.50 to $20.50
Relaying Rails	25.50 to 26.00
Old Steel Rails, rerolling lengths	16.00 to 16.50
Old Steel Rails, short pieces	14.00 to 14.50
Heavy Melting Steel Scrap	14.00 to 14.50
Standard Hammered Iron Car Axles	23.50 to 24.00
Old Steel Car Axles	18.50 to 19.50
No. 1 Railroad Wrought	17.50 to 18.50
Iron Track Scrap	15.50 to 16.50
No. 1 Yard Wrought, long	16.00 to 16.50
No. 1 Yard Wrought, short	14.00 to 15.00
Wrought Pipe	12.00 to 12.50
Light Iron	9.00 to 10.00
Cast Borings	8.00 to 8.50
Wrought Turnings	11.00 to 11.50
Old Car Wheels	16.00 to 17.00
No. 1 Machinery Cast	14.00 to 14.50
Stove Plate	11.00 to 11.50
Grate Bars	9.00 to 9.50
Malleable Cast	15.00 to 15.50

Iron and Industrial Stocks.

NEW YORK, June 27, 1906.

Further weakness has marked the market for iron and industrial stocks in the past week, in some cases the low figures of the year being touched. Wall Street, with its disposition to magnify a development into a movement, has made much of the Southern pig iron situation. In general the lowest prices were made on Tuesday, June 26. The range of prices from Thursday to Tuesday, inclusive, on active stocks, was as follows: Car & Foundry common 36¾ to 39⅛; Locomotive common 67¼ to 72; Colorado Fuel 46½ to 54⅜; Pressed Steel 47 to 50; Republic common 26¾ to 29¼; Sloss-Sheffield common 70½ to 74½; Pipe common 47½ to 49½; Steel common 35¾ to 38⅞, preferred 102 to 104¾. Last transactions up to 1.30 p.m. to-day were reported at the following prices: Can common 6½, preferred 55½; Car & Foundry common 36⅞, preferred 100; Locomotive common 67, preferred 116; Steel Foundries common 10½, preferred 45; Colorado Fuel 46¾; Pressed Steel common 47, preferred 98; Railway Spring common 50; Republic common 27, preferred 96; Sloss-Sheffield common 72; Tennessee Coal 153; United States Cast Iron Pipe common 48½; United States Steel common 35½, preferred 101¾.

A special meeting of the stockholders of the Allis-Chalmers Company has been called for July 16 to approve the resolution of the Board of Directors authorizing the issue of bonds to the extent of $15,000,000. The stockholders will also be asked to approve the additional contract entered into between the company and Shearson, Hammill & Co., representing a syndicate, for the purchase of that part of $12,000,000 of the bonds which shall not be taken by the stockholders. The remaining $3,000,000 will be retained in the company's treasury. About $4,000,000 will be used to reimburse the company for expenditures made in connection with the construction of the new plant at West Allis. The remainder of the proceeds from the bond sale will be used for working capital.

The report of the William Cramp Ship & Engine Building Company for the year ending April 30, 1906, shows net profits of $704,724, which after deducting fixed charges of $333,752 leaves a surplus of $370,972, which is equal to 6.08 per cent. upon the capital stock. The assets shown by the report are $16,562,248, as compared with $16,385,689 for the previous year. The total surplus stated is $3,264,265, against $3,702,357 last year. President Henry S. Grove, in his annual report, says: "I wish again to call attention to the extremely unsatisfactory condition of the shipbuilding business in the United States. This condition is due to the small volume of business offered and the number of yards competing therefor. We have been fortunate in securing a large share of the important contracts. Entering the fiscal year under review there were ten vessels yet in various stages of completion, of which three were for the United States Navy."

The Cleveland Cliffs Iron Company, Cleveland, Ohio, has offered its stockholders a block of $1,110,000 5 per cent. bonds, secured by the three large ore carrying steamships now under construction.

The Union Switch & Signal Company, Pittsburgh, has declared the regular quarterly dividend of 2½ per cent. on the preferred stock and 2 per cent. on the common, payable July 1. The business of this concern is larger now than ever before in its history.

The stockholders of the Passaic Steel Company, Paterson, N. J., have selected a committee to rearrange the finances of the company and place the industry on a sound business and financial basis. The committee, which consists of A. H. Knapp, W. A. Arnold, Henry Dunster, A. P. Trautwein and T. G. Wolf, will meet this week, at which time it is possible that the plan now partly formulated, to call in the bonds and place the company on a stock basis will be completed, and later ratified by the stock and bond holders.

Dividends.—American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock and 1¼ per cent. on the common stock. The preferred dividend is payable July 21.

Westinghouse Electric & Mfg. Company has declared a quarterly dividend of 2½ per cent. on the preferred, assenting and nonassenting stock, payable July 10.

E. W. Bliss Company has declared a quarterly dividend of 2 per cent. on the preferred stock and 2½ per cent. on the common stock, payable July 2.

Manning, Maxwell & Moore, Incorporated, has declared a quarterly dividend of 1½ per cent. payable July 2.

New York Air Brake Company has declared a quarterly dividend of 2 per cent., payable July 18.

Chicago Pneumatic Tool Company has declared the regular quarterly dividend of 1 per cent., payable July 25.

Nova Scotia Steel Company has declared the regular quarterly dividend of 2 per cent. on the preferred stock, payable July 10.

American Seeding Machine Company has declared a quarterly dividend of 1½ per cent. on the preferred stock and 1 per cent. on the common stock, both payable July 16.

Manufacturers' Light & Heat Company, Pittsburgh, has declared the regular quarterly dividend of 1½ per cent., payable July 20.

Westinghouse Machine Company, Pittsburgh, has declared a quarterly dividend of 2½ per cent., payable July 10.

Pittsburgh Valve, Foundry & Construction Company has declared a quarterly dividend of 1 per cent., payable August 1.

La Belle Iron Works, Steubenville, Ohio, has declared a quarterly dividend of 2 per cent., payable August 1.

American Rolling Mill Company, Middletown, Ohio, has declared a dividend of 1½ per cent. on the preferred stock, payable July 15, and an initial dividend of 2½ per cent. on the common stock, payable July 25.

Buildings of Sheet Iron.

A feature of the metal working trade, which promises considerable business in the future to sheet metal workers, is the construction of buildings of sheet iron, either plain or corrugated. In many cases these are built for temporary purposes, especially in countries where the labor is unskilled. An English firm, Bruce & Still of Liverpool, some time ago erected a dock shed 526 feet long and 45 feet wide, in six weeks' time. Other structures as far away as Rio de Janeiro were erected in as short a time comparatively. It is a well-known fact by those conversant with frontier life that many of the structures in Alaska were made of this material, and not only withstood the vicissitudes of the climate, but were amply satisfactory to the owners, as in many cases they desired to move them after two years or so of occupancy. The same may be said of the newly discovered gold fields in Nevada, where galvanized iron is playing an important part in the building operations of these Nevada camps. It would appear that there are many possible combinations of galvanized iron and the widely used building material concrete that would be both profitable and productive of a larger amount of business to the sheet metal worker. Examples of this have lately been seen in the erection of a large building entirely of concrete, including the roof, with the cornice and gutter of copper fastened to short wooden pieces embedded in the concrete. The window frames of this structure also were of sheet metal, and if the development is carried to its logical conclusion undoubtedly sheet metal furniture will be largely used.

Building plans filed during May for the Borough of the Bronx, New York City, show a decrease in the amount involved and probably mark the end of a period of speculative building which has gone to great lengths in that section of the city. The building there was chiefly of five-story apartment houses brought about through the opening of the subway. The total amount for May this year was $3,135,125, against $4,032,525 during the corresponding month last year. In Manhattan, however, the situation is reversed, as the amounts are $14,556,680 and $11,619,500 for May, 1906 and 1905, respectively. A marked increase is noted in the number of large buildings for office, storage and business purposes. The same is true, but to a slightly less extent, in small residences, both of the one and two family type, in the outlying sections. Apartment houses seem to be in oversupply, and in consequence comparatively few of these structures are now contemplated. According to one authority, it was pointed out some time ago that new accommodations had been planned during the past year for 400,000 people in New York City, while the natural increase in population is something like 125,000 or 150,000 per year.

Insulating cold water pipes is frequently done in sections of the country where the water flowing through the pipes is at a comparatively low temperature, the warm air passing over them cooling so quickly as to cause condensation of the moisture in the air. The wet spots under the water pipes are frequently attributed to leaks, but the experienced plumber diagnoses the case as one of sweating. The remedy is to cover the pipes with some kind of nonconducting covering like some of the asbestos productions, protecting the pipes from the warm air. The water from Lake Michigan supplying Chicago, averaging quite low in temperature in summer, is a common source of trouble in this respect.

The Machinery Trade.

NEW YORK, June 27, 1906.

The large machine tool lists, which have been the most conspicuous feature of the market for the past three or four weeks, are gradually being closed out, and instead of receiving the lists to bid on, the trade is now receiving the orders. During the past week two sets of specifications were practically closed, the larger one being that of the Baldwin Locomotive Works. Several of the companies in this territory who submitted bids have received substantial orders from both that company and the New York Central Railroad, which made purchases against the list it sent out the last of May. While no additional specifications for large amounts of tools were sent out the past week, it is stated that the Pennsylvania Railroad will soon issue another list. The demand for machinery continues to be so heavy that merchants are at their wits' ends to know how to cope with it. Their troubles are not confined to securing orders, but to getting the machines to deliver. In this connection it is of interest to note that the smaller manufacturers have extended deliveries to two months, while no very near date of delivery can be set on some of the more prominent tools. Machines for stock are out of the question. One of the most important builders of machine tools has notified its agents that it will receive no orders for stock and will only deliver machines to fill bona fide orders from consumers. Following the action of the National Machine Tool Builders' Association at Atlantic City, the smaller builders are advancing their prices. There is talk in the trade of still higher prices, and another 5 per cent. advance would not be surprising.

Crane Men Meet.

Representatives of a number of the largest manufacturers of electric cranes and hoists got together in New York recently to discuss several matters affecting the trade, and concluded by reaching an agreement regulating what they consider to be one of the greatest evils they have to encounter in the pursuit of business—the giving of blue prints and detail drawings with bids. The manufacturers aver that they have suffered much from the misuse of blue prints and other descriptive materials submitted by them to prospective purchasers, and they determined to impress on the trade the fact that the construction of up to date electric traveling and jib cranes is an engineers' problem, evolved through many years of experience. It has been the custom heretofore on the part of crane builders to be particularly free with such drawings and descriptive matter in making estimates for their customers, and the result has been, it is claimed, that some people have built part of their own equipment and asked the manufacturers to furnish the rest, and with the aid of the information gleaned from the drawings rigged up inferior equipment for their shops without making purchases. It is claimed that some of the largest purchasers have been offenders in this respect, and cases have been noted where people desiring cranes have obtained as many as two sets of drawings from each manufacturer and then decided to patch up a hoist of their own with material at hand and purchased only such parts as they needed to complete it. Crane manufacturers have developed the industry considerably during the last few years, and they declare that it is not fair for them to be asked to give the result of their engineering knowledge and receive no assurance that they will get any pay for it. Accordingly, it was decided that no extensive descriptive plans or drawings are to be given by any of those who took part in the conference, nor are any detailed photographs that might be used for working up a similar contrivance to be given. The confrees emphatically state that no trade combination was effected, and that no action was taken regarding the division of territory or any thing of the kind that might be looked upon as a combination. The reason for the meeting, it is said, was simply the growing abuse of the use of the blue prints, and it was to settle that matter alone that the conference was arranged. It is understood that all those who took part were agreed as to the necessity for some action on the part of crane manufacturers to protect themselves against those who have indiscriminately used the engineering knowledge submitted to them on trust, and made no financial recompense.

The Milan Exposition.

American machinery men who have visited the exposition at Milan, Italy, which was opened last April in celebration of the completion of the Simplon tunnel, speak in glowing terms of the exhibit of American machine tools and other machinery equipment there. A large part of the space devoted to the machinery products of this country is taken up by the Alfred H. Schutte Company, which has gathered together a large number of American machines. The company has 150 square meters of space, and it is showing machinery manufactured by the Cincinnati Milling Machine Company; Bickford Drill & Tool Company; G. A. Gray Company, Cincinnati; Prentiss Bros. Company; Hendy Machine Company; Landis Tool Company and Baker Brothers, Toledo. The company has also on exhibition a number of the various automatics it represents, and most of the machines are shown in operation, equipped with all the special tools they are capable of using. This is true of the exhibits of most of the American manufacturers, and although in point of numbers the American exhibit is outclassed by those of Germany, England and France, the quality in the various lines is not excelled, and the American section is constantly surrounded by large delegations of foreign engineers and mechanical men. Among the manufacturers exhibiting are the Olds Motor Works, Lansing, Mich.; Oliver Chilled Plow Works, South Bend, Ind.; Pratt & Whitney Company, Hartford, Conn.; New York Leather Belting Company, New York; National Cash Register Company, Dayton, Ohio; Prentiss Brothers Company, Worcester, Mass.; Reo Motor Car Company, Lansing, Mich.; Schaeffer & Budenburg Mfg. Company, Brooklyn, N. Y.; Sharpless Separator Company, Westchester, Pa.; L. S. Starrett Company, Athol, Mass.; Sterling Emery Wheel Company, Tiffin, Ohio; Stover Mfg. Company, Freeport, Ind.; B. F. Sturtevant Company, Boston, Mass.; United States Shoe Machinery Company, Boston, Mass.; Vermont Farm Machine Company, Bellows Falls, Vt.; Walter Bushnell & Glessner Company, Chicago, Ill.; Westinghouse Machine Company, Pittsburg, Pa.; Acme Machinery Company, Cleveland, Ohio; American Clay Working Machinery Company, Bucyrus, Ohio; Aurora Automatic Machinery Company, Aurora, Ill.; Baldwin Locomotive Works, Philadelphia, Pa.; J. G. Brill Company, Philadelphia, Pa.; Brown & Sharpe Mfg. Company, Providence, R. I.; Chicago Pneumatic Tool Company, Chicago, Ill.; Cincinnati Milling Machine Company, Cincinnati, Ohio; Cincinnati Shaper Company, Cincinnati, Ohio; Collins Plow Company, Quincy, Ill.; Deering Harvester Company, Chicago, Ill.; Fairbanks, Morse & Co., Chicago, Ill.; Foster Engineering Company, Newark, N. J.; H. H. Franklin Mfg. Company, Syracuse, N. Y.; Gisholt Machine Company, Madison, Wis.; Hendey Machine Company, Torrington, Conn.; Hill, Clarke & Co., Boston, Mass.; Johnson Harvester Company, Batavia, N. Y.; Lozier Motor Company, New York; McCormick Works, Chicago, Ill.; Morse Twist Drill Company, New Bedford, Mass.

Railroad Requirements.

Good sized orders were placed this week by the New York Central Railroad against the list it issued the last of May. That list, it will be remembered, covered tools to the amount of about $30,000, and it is thought that the whole amount has now been purchased. The tools which are destined for Croton will be furnished by several companies. Nothing further has been heard concerning the large list which the road has about completed, but the merchants are looking for it almost any day.

A plot of ground at Jacksonville, Fla., has been purchased by the Seaboard Air Line as a site for new shops. Thus far plans for the shops have only been made in a preliminary way, and it will be several months before the final plans are prepared and the specifications for the machinery equipment completed. The work is in charge of R. P. C. Sanderson, superintendent of motive power, whose headquarters are at Portsmouth, Va.

New shops are to be erected by the Chattanooga Railway Company, Chattanooga, Tenn., at a cost of about $40,000. It is the intention to erect shops which will be modern in every respect for repairing cars, the site for which has already been secured. The company is to improve its system as quickly as possible, and will start the erection of new shops as soon as plans and specifications can be prepared.

Dickson Car Wheel Foundry.

Plans have been practically finished for the new plant which is to be constructed by the Dickson Car Wheel Company, Houston, Texas, on a plot of ground 250 feet wide and 1500 feet long, which the company recently purchased. The company is now ready to receive bids on the building and machinery for the new car wheel foundry, the capacity of which will be 400 wheels per day. In addition to the car wheel foundry the plant will contain a general foundry and machine shop, all the buildings to be fireproof and of modern construction. The main building will be approximately 150 x 320 feet and will be constructed of concrete and steel. The equipment for which the company is now in the market will include either a 96 or 102 inch cupola, to receive blast from a positive blower, electrically driven, direct connected; electric surface tram for the handling of hot iron and wheels; hydro-pneumatic floor hoists having two-way power, giving hoist and lateral motions; 60 annealing beds, to have a capacity of 20 wheels each and to be in straight line with hoisting apparatus, to be electric or pneumatic; two 3-ton elevators of modern and economical type; one 2200-pound drop hammer, having 16 feet drop; one 10-ton reservoir ladle geared to be run by electricity, necessary tracks, turntables, &c. For the power plant the company will require one steam driven air compressor to deliver 1000 cubic feet of free air per minute

with 120 pounds pressure at the tank, or two machines having the same capacity; two air receivers with an approximate capacity of 600 cubic feet each; one 220 horse-power 110-volt alternating current generator; one 200 horse-power Corliss engine; four 100 horse-power water tube boilers; one heater with sufficient capacity for the four boilers; two feed water pumps, each with a capacity of 400 horse-power, and the necessary motors for operating the machinery. In all cases where possible the machinery is to be direct connected to motors. The company desires those who bid on the machinery to quote prices f.o.b. Houston, and where practicable the machinery to be erected and turned over to the company ready for operation. As the company intends to make this new plant the most modern of its kind in the country it is likely that considerable attention will be given to the bids sent in and that the best class of machinery adapted to the purpose will be purchased.

The Globe Foundry Company, Port Chester, N. Y., has practically completed arrangements for a piece of property at Huntington, W. Va., which will be used as a site for its proposed new plant. Quite a large amount of equipment will be required for the new plant, as the company intends to equip it with new machinery throughout and intends to spend from $75,000 to $100,000 in the construction of buildings and purchase of machinery. While the plans for the buildings are only now being prepared and it will be three or four weeks before they are completed, they will call for a molding shop about 150 x 400 feet, with necessary cleaning rooms, stock rooms, &c. The buildings will probably be constructed of concrete sides, glass and slag roof, which will be supported by steel trusses. The plant will be equipped for the manufacture of soil pipe and fittings, steam and hot water boilers and cast iron radiation. William A. Mills, vice-president, has the matter in charge.

The Colorado Gray Iron Foundry Company, Denver, Col., which was recently organized by J. M. Herbert and associates, has completed plans for its new plant, which will consist of a main foundry building, 110 x 250 feet, a pattern shop and pattern storage and power plant. The plant will be equipped with one 20-ton four-motor, one 5-ton three-motor and two 2-ton three-motor electric traveling cranes, one locomotive crane of about 5 tons capacity, one cupola 96 inches in diameter, one cupola 60 inches in diameter, two blowers of 63 and 25 cubic feet per minute, respectively, one belt driven air compressor with a capacity of 150 cubic feet per minute, elevators and various other machines for a complete foundry equipment. The building will cost in the neighborhood of $35,000 and the machinery about $90,000. The output, at the start, will be approximately 100 tons daily.

Another New Car Plant.

The Continental Car & Equipment Company, 17 Battery place, New York, has purchased 13 acres of ground near the Highland Park section of Louisville, Ky., and will erect a large plant, with the idea of supplying the Eastern and Western territories. The company makes a specialty of logging cars and builds several other types of industrial cars, all of the wooden frame style. The company is now getting its equipment for the new plant, which will include a main structure, about 100 x 270 feet; two other buildings, 60 x 90 feet, and several smaller structures. There will be no power equipment required, as the company has arranged to purchase all the power it will use, but the list of requirements will include some heavy tools for manufacturing the under frames and running gears of the cars, as well as some heavy wood working equipment for making the bodies. It is expected that the plant will be completed about the middle of September, and at first about 150 men will be employed there. The company will not use all of the land it has purchased as yet by any means, but the plans for the plant provide for its being enlarged later on, and it is expected that this will have to be done very soon. N. B. Porter is to be the general manager of the plant, and he has taken up his headquarters at the Seelbach, Louisville, Ky., and will attend to the details connected with the construction of the buildings and the installation of the machinery equipment. The company has a large car plant at Bloomsburg, Pa., where cars similar to those to be turned out at Louisville are being built at present.

Considerably more machinery is required by the Standard Roller Bearing Company, Philadelphia, Pa., manufacturer of steel, brass and bronze balls, ball bearings and roller bearings. For the last six months or more this company has very largely increased its capacity by the erection of new buildings and the installation of new machinery, a great deal of which it has purchased. During that time it might almost be said that the company was continuously in the market for new machines. Further increase in capacity is to be made by the erection of a new building, 71 x 117 feet, which is to be constructed of reinforced concrete, and which is to be five stories high. To conform with all other buildings of the company this one is to be equipped with a full line of the most modern tools, and the company is now in the market for lathes, drills, radial drills, power saws, milling machines and automatic and semiautomatic machines. The building is to be constructed and equipped under the direction of Samuel S. Eveland, vice-president and general manager.

A large amount of machinery is required for the new brick plant which is to be constructed by the Columbus & Hocking Clay & Construction Company, an allied interest of the Columbus & Hocking Coal & Iron Company, Columbus, Ohio. Plans have been completed and specifications and blue prints may be had on application by prospective bidders to R. A. Magley, general manager of the new company. The plant is to be operated by electricity, which will be supplied from a central power station, where a producer gas plant will be installed, also five 200-kw. gas engines. The contract for the electric equipment will be a large one, and the company states that as no favoritism will be shown in awarding the contracts every bidder will be on an equal footing and stand an even chance of having his bid accepted on its merits.

The Stromberg-Carlson Telephone Mfg. Company, Rochester, N. Y., is purchasing an extensive list of equipment for additions which are being made to the company's large plant at Rochester. The company is adding about 750 horse-power to its power plant and the equipment for that has all been purchased, but there is considerable to be bought yet, it is understood, in the line of general machinery.

Ground was broken at Harrison, N. Y., on June 23, for the construction of the New York & Port Chester Railway, which is to connect the metropolis with the latter named place. The breaking of the ground was made the occasion of a celebration, and it was then announced that the construction operations would be proceeded with as rapidly as possible. This will mean that before long the trade will hear of some extensive requirements for the equipment of a power house and substations, as well as a repair plant and other buildings which the company intends to erect in connection with its road. The New York & Port Chester Company, which was organized some time ago for the purpose of constructing the road, expects to build about 110 miles of electric road, to extend from the Southern boulevard in the Bronx through New Rochelle and other small towns into Connecticut. C. O. Mallion, 76 William street, New York, is electrical engineer for the company, and he has been busy for some time preparing plans for the power house and arranging other details connected with the mechanical end of the enterprise. All necessary surveys have been completed and the work of construction has been begun somewhat before the company had hoped for, although arrangements were made as soon as the way was clear, to hurry the operations. The size of the power house and substations have not been entirely determined upon as yet, nor is the company prepared to announce just where they will be located. No contracts for mechanical equipment have been let, and it is thought that those details will not be gone into before, at least, a couple of months. All of the buying will be done in the metropolitan district, and Mr. Mallion will probably be in charge of that work.

P. R. Moses, 320-322 Fifth avenue, New York, is purchasing equipment for a color factory, to be erected at Creamer and Bay streets, Long Island City, for K. Kolenstamm & Brother. The requirements include a slow speed Corliss engine and a 75-kw. alternating generator, ten alternating current motors from 5 to 15 horse-power, and feed water heaters of a large size. Mr. Moses is the consulting engineer for the firm and will have charge of the selection of all the mechanical equipments of the plant.

Bids will be opened at the office of the Department of Correction, 148 East Twentieth street, New York, on July 3, for furnishing a 100-kw. engine type generator with field rheostat for switchboard mountings, &c., to be delivered and erected at Hart's Island, N. Y.

Business Changes.

John G. Wright, who has for some months had charge of the New York office of the Hooven, Owens, Rentschler Company, Hamilton, Ohio, as Eastern manager, has just been formally appointed to that position, to succeed William B. Mayo. Mr. Mayo was Eastern manager of the company for 12 years, and last November went to Hamilton to succeed C. O. Richter as secretary, and at that time he assumed charge as general manager at Hamilton. The arrangement then was not considered permanent, but now the company has made Mr. Wright the Eastern manager and Mr. Mayo, who has had great success with the management of the company's plant, will continue to hold the office he was appointed to last November. While many machinery men who knew Mr. Mayo during his long years of service in New York will regret to hear he is to be located at Hamilton permanently, they will be equally pleased to hear of Mr. Wright having been given direct charge of the company's Eastern business. Mr. Wright, who is very well known in the trade, has been connected with the Hooven, Owens, Rentschler Company since March, 1900, and has had much to do with the conduct of its affairs here while Mr. Mayo was in charge. Mr. Mayo is a member of the American Society of Mechanical Engineers and has had an important part in the development of the power business.

The Hooven, Owens, Rentschler Company has been

awarded the following contracts for its new type of high speed Corliss engines; 300 horse-power for the Railway Steel Spring Company, Depew, N. Y.; 300 horse-power, R. Hoe & Co., New York; 300 horse-power, Standard Bleachery Company, Passaic, N. J.; 150 horse-power, Metropole Construction Company, New York, for the new Knickerbocker Building at Sixteenth street and Fifth avenue, all direct connected to generators; three 600 horse-power cross compound direct connected, New York, New Haven & Hartford Railroad for Reidville, Mass.; 900 horse-power cross compound direct connected, Columbia Improvement Company, Boston, Mass., and for the following Corliss engines: 750 horse-power cross compound direct connected, Stromberg, Carlson Telephone Mfg. Company, Rochester, N. Y.; 200 horse-power tandem compound, Lehigh Valley Coal Company, Mt. Carmel, Pa.; 400 horse-power direct connected, American Wood Working Machinery Company for its Rochester plant; 250 horse-power, A. W. Darling, Hollister, Mass.; 100 horse-power, American Tobacco Company, and two 400 horse-power direct connected engines for the Metropole Construction Company, also for the Knickerbocker Building.

Catalogues Wanted.—The Bernard-Greenwood Company, 20 Desbrosses street, New York, desires catalogues and price-lists from manufacturers of materials for steam, water and gas.

New England Machinery Market.

WORCESTER, MASS., June 26, 1906.

The automobile manufacturers are coming into the market for large aggregate purchases of machine tools, anticipating their wants because of the long time required for deliveries. This is responsible to some extent for the steady maintenance of the spring volume of business. There has been no abatement in orders, the dealers are unanimous in stating. If there is to be any letting up in business during the summer it is not yet in sight.

Foreign orders are entirely satisfactory to the machine tool builders, or perhaps it is better to put it that orders from across the water would be satisfactory if domestic business were much lighter. Comment is made on the feeling of unrest manifest in Germany, and the statement at the recent meeting of the Central Association of German Manufacturers, embracing most of the great organizations of manufacturers of that country, that the United States has taken no steps toward reciprocal tariff relations during the extension of time of the treaty duties. It is believed this will lead to the placing of large orders for delivery before the extension expires in 1907. With the present conditions of deliveries such orders will have to be placed within the next few months if they are to be landed in Germany before the tariff goes into effect—that is, of course, providing that this country does not meet the Germans in their desire for a continuation of satisfactory treaty arrangements. At the present time orders for machinery are coming from most European countries in steady and profitable volume.

The machine tools and other equipment and the shops of the Shaw Machinery Company, Lowell, Mass., will be sold at auction, Wednesday, July 25. The tools will be sold by parcel, affording an opportunity for the purchase of a large amount of machinery which is now practically out of the market. The sale has been ordered by the United States Circuit Court, and the only alternative is for some interested party to come forward and pay the full amount of the indebtedness, which would take the company out of bankruptcy. The list of machine tools is an unusual one, especially as with a few exceptions nothing had been used for more than a few months. Some of the tools have never been started up. The list includes 12 Potter & Johnson automatics; ten Bardon & Oliver screw machines; ten Cincinnati milling machines, of all sizes up to the largest; a 24 x 24 inch Chandler planer; a 30-inch square Flather planer; a 36-inch square Flather open side planer; some 15 upright drills, Barnes, Boynton & Plummer and Washburn Shops; two multispindle drills of the Foot-Burt Company, Cleveland; a 1⅜-inch automatic of the National Acme Mfg. Company, Cleveland; a No. 2 Brown & Sharpe automatic; 25 engine lathes, from 9 to 28 inch swing, of various lengths, beds and of several makes, including the Lodge & Shipley Machine Tool Company, Flather & Co., Inc., Fay & Scott, Putnam Machine Company, and several Prentice lathes; a Becker-Brainerd 18-inch gear cutter; two Gould & Eberhardt shapers, 16 and 20 inch; six Diamond Machine Company's spindle roll grinders; a No. 12 Landis grinder; two tool room grinders of the Cincinnati Milling Machine Company; several Washburn Shops drill grinders; a Bath grinder; a Blount grinder; two English tools, a Rider sextuple hammer and Rider broaching machine, suitable for use in an automobile factory, and the only special tools in the list; several made over Brown & Sharpe manufacturing millers, purchased from the Household Sewing Machine Company; a Billings & Spencer 800-pound drop hammer; six Bradley cushion helve hammers, from Bradley & Co., Syracuse, N. Y.; a Fisher shear, capacity 1½-inch round, Fisher Foundry & Machine Company, Pittsburgh; six Excelsior Needle Company's swaging machines; a Beaudry & Co. 125-pound power hammer; full set tinsmith's tools, including squaring shears, formers and furnaces; a complete Gilbert & Barker oil plant. It is very unusual that a sale of machine tools creates such interest—one might almost say excitement—but when it is considered that many of the tools cannot be bought in the market under a year's delivery, some of them not under 15 months' delivery, that the market is even depleted of second-class tools of some types that will be sold, it is not surprising that a record-breaking attendance for this class of sale is expected. The auctioneer's list is not yet ready for distribution. J. Lewis Stackpole, Jr., 53 State street, Boston, the receiver, will conduct the sale, with the assistance of an auctioneer.

The Monarch Valve & Mfg. Company has been organized at Springfield, Mass., to manufacture valves and valve gates. The factory of the Torkelson Mfg. Company, Warren, Mass., has been leased, and preparations for manufacturing have already begun. The company will require considerable machine equipment, but not for four or five months, it is given out, for it will take some time to work out preliminaries to manufacturing, including getting out the models. It is planned to begin with the manufacture of valves from 1½ to 2 inch, and to take up valve gates as soon as possible. The company is incorporated under Massachusetts laws, with an authorized capital stock of $75,000. The officers are: President, Charles J. Roadstrand; vice-president, J. W. Superneaw; treasurer, Stuart A. Robson; clerk, H. E. Jodoin, all of Springfield. Fred. M. Lane, who for 30 years has been connected with the Chapman Valve Mfg. Company, Indian Orchard, Mass., as superintendent and in other capacities, will be manager and superintendent of the new business. Other men experienced in the valve manufacturing business who will be associated with the company are: Mechanical engineer, M. J. Meeker; general foreman, A. F. Winton; foreman of wood working and pattern department, R. H. Powell; foreman of brass foundry, O. E. Hines. The main office of the company will be at Springfield.

The Brown & Sharpe Mfg. Company, Providence, R. I., will close its works August 3 for the usual two weeks' vacation.

The American Emery Wheel Works, Providence, R. I., is erecting a three-story addition, 50 x 60 feet, to be used in increasing the molding department and to permit of carrying a larger stock of finished wheels. The addition is made necessary by the increase in the company's business.

Niles-Bement-Pond and Pratt & Whitney companies will move out of their Boston offices and show rooms at 144 Pearl street, July 1, taking up new quarters on the eighth floor of the Oliver Building. They intend to carry a general stock of machinery at their storehouse, but will rely for their main source of supply on New York and Hartford.

Joseph F. Sadler, vice-president of the Fenn-Sadler Company, Hartford, Conn., manufacturer of machine tools, has retired from that business and will establish a machine shop of his own at Hartford.

The Croatan Company, Hartford, Conn., is in the market for machinery and equipment, boilers, engines, transmission, grinding and pulverizing machines. The company will equip a plant to quarry talc and agalmetalite at Glendon, N. C., and the first unit of machinery to be installed will produce about 50 tons of finished material a day. The company will operate a short railroad and is building a dam to hold back a large body of water. The deposits of the stone are said to be of fine quality, equal to that of any found in France or Italy. The company is capitalized at $600,000 and the officers are: President, Fred. M. Peck, Hartford; vice-president, D. P. Bible, Glendon, N. C.; treasurer, Nelson D. Merwin, Hartford; secretary, R. W. Farmer, Hartford, and superintendent, Joseph J. Stockton, Glendon.

The International Silver Company is to enlarge its factory at Bridgeport, Conn. A manufacturing building, one story, 40 x 126 feet, and a three-story office building, 26 x 50 feet, will be erected immediately.

The city of Pawtucket, R. I., is in the market for a 15,000,000-gallon pumping engine, bids for which will be received up to noon of July 9.

The *Gazette* of Cologne, Germany, publishes this week a series of complaints from manufacturers concerning the attitude of the United States with respect to the "most favored nation" clause in the tariff arrangement between the United States and Germany. It was understood, the *Gazette* says, that the burden of the American ad valorem duties, by which German Manufacturers were so harassed and damaged, would be appreciably mitigated. Complaint is now made that instead of this the United States custom house officers have arbitrarily raised declared values so that certain classes of German exports to America have now become impossible.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 26, 1906.

The placing of orders for the major portion of the requirements of the Baldwin Locomotive Works on their recent specifications has been the feature of the trade during the past week. This business has had a large share of both manufacturers' and dealers' attention during the past few weeks, and while all the purchases have not been placed the local trade has been favored with the major portion of the business closed.

The extensive requirements of the various railroads which have recently come before the trade do not move as rapidly as desired. Some little business has been closed by the Pennsylvania Railroad, but this has been largely on individual specifications.

Some small business has also been done in minor shop equipment, while there is an improvement noticeable in the demand for indivjdual tools for extension and replacement. On the whole, the market has a much better tone and the trade is generally satisfied with existing conditions.

Manufacturers of all classes of machinery and tools continue actively engaged and have in some instances taken on quite a volume of additional business. Plants are being maintained in continuous operation at full capacity, and with the amount of new business coming in from time to time there is practically no chance in the near future to improve on deliveries, nor to get a stock of any of the sizes of tools usually in demand.

Inquiries are reported to be in better volume, and in addition to the larger specifications recently before the trade there has been a good demand for individual tools, more particularly those of the medium and smaller sizes. Foreign demand for the standard lines of machine tools remains unchanged. Special tools and machines as well as power transmission equipment are in good demand, and manufacturers of these lines report a satisfactory business.

Sales of engines and boilers of the higher powers have improved, and orders for some large equipment, both for local and nearby customers, have recently been taken. The demand for those of the medium and smaller types, however, has not been so good, notwithstanding the fact that inquiries have been in good number, and while makers and dealers have a large number of quotations out, prospective buyers seem rather inclined to withhold orders for the time.

Delayed deliveries in new machine tools continue to have some influence on sales of second-hand tools. Many prospective buyers, being unable to wait for long deferred deliveries of manufacturers, have been compelled to seek second-hand tools to meet their requirements for the time, and on which practically immediate delivery can be had. This demand, however, has cleaned the market fairly well on some lines and sizes in the better grade of tools. Second-hand engines and boilers, particularly in the medium and smaller sizes, have not been very active and reflect on the whole conditions which govern that branch of the trade.

Both steel and gray iron castings continue in excellent demand, and the foundries are all actively engaged. The steel casting plant of the Federal Steel Foundry Company, Chester, Pa., ran its first heat last week, and its tonnage should aid some in the early delivery of castings of that class. In some lines manufacturers complain of delayed delivery of machinery castings, but as a rule gray iron jobbing foundries are able to make fairly good delivery.

The American Railway Master Mechanics' convention at Atlantic City last week received even more attention from the local trade than did the Master Car Builders' convention held at the same place during the preceding week. Manufacturers and dealers from this vicinity were prominent in the attendance, which was unusually large. The feature of the week's entertainment was the visit by the Master Mechanics to the Baldwin Locomotive Works of this city, a special train being furnished for this purpose by the Philadelphia & Reading Railroad.

The Department of Public Works, Bureau of Survey, city of Philadelphia, will receive proposals until Wednesday, July 11, 1906, under Schedule C, for a hydraulic compression machine for the testing laboratory. This machine is to act vertically like a hydraulic press, and is to have a capacity of 1,000,000 pounds. It must be adapted to take in specimens 36 inches long, 18 inches wide and 30 inches high. Belting and countershaft for the machine are to be included in the bid. Specifications may be obtained from the Director, or from the Bureau of Survey, 416 City Hall.

The Philadelphia Rapid Transit Company has plans prepared for additional stories to its present repair shop at Kensington avenue and Seargent street. It is yet undecided whether any additional tool equipment will be required, although the new addition is to be used for car repair work. Bids are also being taken by this company for a one-story reinforced concrete car barn, and a two-story office building, 370 x 495 feet, to be built at Twenty-sixth street and Allegheny avenue.

The Baldwin Locomotive Works has placed orders for the greater portion of the tools for additional equipment to its local plant, specifications for which have been before the trade for a month past. A large amount of this business was placed with local manufacturers and representatives, principal among whom were the William Sellers Company, E. Harrington & Son Company, Incorporated, Manning, Maxwell & Moore, Niles-Bement-Pond Company, the Fairbanks Company, W. E. Shipley and Hilles & Jones Company of Wilmington, Del. The cost of the tools ordered closely approximates $300,000, which brings the total amount expended for tools this year by the Baldwin Works up to $750,000.

The Standard Roller Bearing Company has begun the erection of a four-story addition to its plant at Forty-eighth street and Merion avenue. The building will measure 71 x 117 feet and be constructed of reinforced concrete. The new building will, on completion, be used for general manufacturing purposes.

The George W. Blabon Company has begun operations on a four-story warehouse, 72 x 222 feet, at Blabon avenue and the Philadelphia & Reading Railway, and a print house and machine room, 75 x 198 feet, adjacent to the former building. The latter building will be used for the manufacture of oil cloth.

Formal awards of contracts for the continuation of work on the filtration system for the City of Philadelphia are announced by the Director of Public Works. The aggregate amount of the awards just made is $1,848,016.45, which includes contracts with Walter Wood & Company, Philadelphia, Pa., for 3229 tons of Cast Iron Pipe; East Jersey Pipe Company, 53,000 feet of lock bar steel pipe; James McNeill & Brother, 26,400 feet of riveted steel pipe, and Carroll, Porter Company, 23,000 feet of riveted steel pipe. The Fairbanks Company received the award for valves in connection with this pipe. Awards for laying the pipes were also made, as was also that for the building of the Torresdale Pumping Station, the latter being awarded to David Peoples at a cost of $117,000.

W. E. Shipley, on the Bourse Machinery Floor, reports a very satisfactory condition of business. Inquiries, both for large and small equipment, have been numerous and some very satisfactory orders, both for sigle tools and larger equipment, have been taken. A number of tools covering the machine shop equipment have also been furnished a new fiber mill in Newark, Del.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 26, 1906.

Trade during the past week in the machine tool line has shown no signs of abatement, and the shops are gradually getting farther behind in deliveries, owing to the continued influx of new orders. The scarcity of labor is growing more and more apparent, and is causing considerable uneasiness on the part of the manufacturers. This is not applicable to any particular line of tools, but throughout the general list there is the same trouble, which naturally restricts the output of the various plants. There seems to be an effort on the part of machine tool builders to advance the price of their tools, and all along the line comes the report that such a change is being contemplated. Quite a little interest is centered in the report that three or four of the large tool builders were seriously considering the proposition of making a move from present quarters to larger and more spacious grounds in the suburbs. This is not an entirely new proposition, but has been talked of for a year or two without any definite action being taken. Four companies are interested in the negotiations, and three of the four, it is said, have agreed to make the move. This movement contemplates the erection of a central power plant, and as several of the plants are now occupying very cramped quarters it is very probable that the deal will go through.

The steel foundry plant, which made its initial run one week since, is now running two melts each day, and all is in complete working order. Orders are booked ahead for several months without being able to supply the demand for castings from Cincinnati builders alone. W. L. King, formerly with the National Electric Company, Milwaukee, has been appointed assistant general manager of the plant, and will assist Mr. Robinson in its management.

The Sebastian Lathe Company reports great difficulty in securing the requisite number of skilled machinists to conduct its plant as desired. Trade is excellent, orders coming forward in large lots.

The Houston, Stanwood & Gamble Company advises

that sales during the past 90 days have been 50 per cent. larger than at any time since the establishment of the business 15 years ago. This is especially true in the saw mills and planing mills along the Gulf and about Puget Sound. Trade in Arkansas and Texas with those who furnish outfits for ginning cotton has also been exceptionally good. The tools in the new boiler department are now in position and work is proceeding in a satisfactory manner. The working force in this portion of the shop is being continually augmented, so that when under full headway there will probably be 100 men at work on boilers and sheet iron work. This building is a structural iron building, 140 feet wide and 340 feet long. Provision for light is excellent, as there are 44 large skylights, in addition to the sides and ends being largely constructed of glass. The two side bays have 18 feet head room, while the center bay, where the large traveler is, has 30 feet head room. The center bay is covered by a Shaw traveling crane of 20 tons capacity, and the side bays with lighter cranes of 5 tons capacity for handling material in sheet iron work. There is also a hydraulic riveting machine of 8 tons capacity, built by the Chambersburg Engineering Company. This same party also furnished hydraulic hoist and overhead handling apparatus for riveter. The pump for furnishing pressure for the hydraulic apparatus was built by the Snow Steam Pump Company, Buffalo. The large bending rolls and punches were built by Hilles & Jones, Wilmington, Del. The Bickford Drill & Tool Company furnished the radial drill for extra heavy duty in boiler work, while the beveling shear came from the Lennox Machine Company, Marshalltown, Iowa.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 26, 1906.

The continued active building operations by companies in this territory who use metal working machinery indicate very clearly the sound condition of business in the various lines of machinery. As is the case with other sections of the country the demand for machine tools continues very heavy in this market, and manufacturers are finding it difficult to make deliveries within anything like a reasonable time. There is some talk in the trade of making another advance in prices.

The Hussey Drop Forge & Mfg. Company, Cleveland, has disposed of its business to the Cambria Forge Company, located at Johnstown, Pa., a company recently formed with $150,000 capital stock. W. M. Brown, electrical engineer of the Lorain Steel Company, is president of the company, and P. L. Hussey, formerly president of the Hussey Company, is general manager. The manufacturing plant is being completely equipped, and will be of modern type. The forge shop is 65 x 125 feet; die sinking shop, 35 x 60 feet, and two stories high, and the machine specialty department, 35 x 60 feet. Each shop will be run by individual motors. Special roughing out, breaking down and board hammers have been installed for working nickel and chrome steels. Trimming presses for hot trimming forgings, bending machines, upsetting machines and 11 steam hammers of various sizes have been installed. The plant will be in operation the latter part of August. Meanwhile the Cleveland plant is running day and night to take care of orders for automobile material.

The Cleveland Construction Company, Cleveland, has contracts for building the Cleveland, Ashland & Mansfield Railroad, 43 miles in length, and the Youngstown & Ohio River Railroad, 50 miles in length, both electric lines. It has recently placed contracts with the Cambria Steel Company for about 80 miles of 70-pound T-rails, and with the American Steel & Wire Company for copper wire for the entire overhead work and feeder systems for the two roads. Contracts will shortly be closed for 20 52-foot passenger coaches for these two lines and for power house equipment for the last mentioned road. The equipment will include two 1000-kw. units; either turbo generators or reciprocating engines to be installed; also about 2000 horse-power of boilers to be equipped with automatic stoker. W. E. Davis, Citizens' Building, is chief engineer of the company.

The Roberts & Abbott Company, Cleveland, consulting engineer for the Cleveland, Ashland & Mansfield Railroad, has completed plans for the building and equipment for a car house and repair shops to be located at Mansfield. The building will be 41 x 184 feet, with a wing, 20 x 71 feet. In addition to boring mill, lathes, planer, wheel press and other repair shop equipment, there will be installed a 3-ton crane and chain hoist, four pneumatic car jacks and an automatic sprinkler system covering car house and shop.

The Williams Automobile Company of Akron, Ohio, has been chartered, under laws of South Dakota, with $1,000,000 capital stock. The incorporators are Harry Williams, Geo. W. Phillips, Edward N. Granthan, Harvey Musser, Henry Robinson and John F. Townsend, all of Akron. The company will erect a large plant at Akron, and will manufacture gasoline automobiles under patents granted to Mr. Williams.

The American Shipbuilding Company, Cleveland, has closed another contract for a large freight steamer, making 12 boats of this class, and a passenger boat which will be the largest on the Great Lakes, under contract for 1907 delivery. The latest order was placed by William and Arthur H. Hawgood of Cleveland. The boat will have a capacity of 11,000 tons and will cost $410,000. She will be 552 feet over all, 56 feet beam, 32 feet deep and will have 32 hatches, and will be fitted with Grosseau patent hatch covers.

The Great Lakes Towing Company, Cleveland, has decided to place a contract for a powerful wrecking tug, larger by half and more powerful than any craft of its kind either on the lakes or the coast. The tug will be 180 feet long, and will be equipped with the most powerful cranes and wrecking machinery for handling the large lake vessels now in use.

The Elyria Milling & Power Company, Elyria, will install a 1500 horse-power water wheel and generator at a plant to be erected at the East Falls, in Elyria. In addition it will purchase two large gas engines for use in the dry season and in case of accident to the water wheel.

The Arctic Ice Machine Company of Canton, Ohio, is working double time on large orders for ice machinery, the recent advance in the price of ice having caused a tremendous demand for artificial ice plants. It is erecting a 300-ton refrigerating plant and a 600 horse-power cross compound engine for the Jacob Dold Packing Company, Cleveland; a large ice machine outfit for the Knolker Ice Cream Company, Canton, Ohio, and has numerous other large orders from various parts of the country.

The Canton-Akron Railway Company, Canton, Ohio, will shortly place contracts for a locomotive crane, to be equipped with a 50-foot boom, for elevating coal from cars to an overhead bin over the boiler room. The fuel will be crushed and fed to stokers by an automatic conveying outfit. Contracts have been placed with the Model Stoker Company, Dayton, for automatic stokers for 3000 horse-power of boilers.

The Morton Truck Company, Toledo, is preparing to erect a five-story concrete building, 50 x 100 feet, to be located on the Clover Leaf Railroad, near Toledo.

The Stirling Consolidated Boiler Company is making extensive additions to its plant at Barberton, Ohio. In addition to a foundry, 120 x 500 feet, recently referred to in these columns, there will be another building of the same size, which will be known as the A. & T. drum shop, in which will be manufactured the Cahall type of water tube boilers heretofore manufactured at Mansfield by the Aultman & Taylor Machinery Company. Buildings formerly occupied by the National Drill & Mfg. Company adjoining the Stirling plant have been acquired, and will be used for a bending department, stack shop and pipe shop. Other additions will be built to the test department and machine shop. The improvements being made at these works will cost in the neighborhood of $600,000.

A. H. Sharp, Columbus, Ohio, is at the head of a company which proposes to build a water power plant in the Sandusky River, near Tiffin, Ohio. There is a fall of 75 feet, and it is believed there is sufficient head to generate 3000 horse-power for eight to ten months in the year. The company has made application for a franchise in Toledo, and aims to transmit power to that city for street lighting and commercial use.

Government Purchases.

WASHINGTON, D. C., June 26, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 10 for generating set, hydraulic jacks, motor and other supplies for the Eastern navy yards.

Isthmian Canal Commission will receive bids until July 10, circular 314, for a quantity of supplies, including flue cutting machines.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until July 21 for four turbo alternators, engines, generators, boilers, coal handling machinery, electrical equipment, pumps, two air compressors and accessories and other supplies for the Charleston Navy Yard.

Proposals will be received at the office of the United States Reclamation Service, Billings, Mont., until August 7, for the construction of a pumping plant to consist of two vertical shaft pumping units and accessories.

Supplies are required for the Indian schools as follows:

Chilocco, Okla., pipe machine, reseating machine, pump, motors; Phœnix, Ariz., pipe cutting machine.

The Isthmian Canal Commission will soon ask for bids for two vertical boxing machines, 50 steel pressure blowers, two positive rotary blowers, four 35-ton bridge jacks, six 25-ton ball bearing jacks, four 20-inch traversing jacks, four No. 28 jacks, four No. 24 jacks, four No. 10 jacks, four geared wrecking jacks and other supplies.

The following bids were opened June 19 for supplies for the navy yards:

Bidder 10, American Woodworking Machinery Company, New York; 18, Buffalo Steam Pump Company, Buffalo, N. Y.; 19, E. W. Bliss Company, Brooklyn, N. Y.; 20, F. S. Banks & Co., New York; 24, Brown & Sharpe Mfg. Company, Providence, R. I.; 26, Buffalo Forge Company, New York; 28, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 54, Compressed Air Machinery Company, San Francisco, Cal.; 66, Drew Machinery Agency, Manchester, N. H.; 67, Dunham, Carrigan & Hayden Company, San Francisco, Cal.; 72, Erie Foundry, Erie, Pa.; 76, Fairbanks Company, New York; 79, Fox Machine Company, Grand Rapids, Mich.; 82, Richard H. Grey, East Oakland, Cal.; 85, R. W. Geldart, New York; 89, Garvin Machine Company, New York; 97, Hartman Company, Philadelphia, Pa.; 98, Hisey-Wolf Machine Company, Cincinnati, Ohio; 101, Henshaw, Buckley & Co., San Francisco, Cal.; 103, Handlan-Buck Mfg. Company, St. Louis, Mo.; 107, Harran, Rikard & McCone, San Francisco, Cal.; 108, Independent Pneumatic Tool Company, Chicago, Ill.; 109, Ingersoll-Rand Company, New York; 110, Industrial Works, Bay City, Mich.; 113, Jeansville Iron Works Company, Hazleton, Pa.; 117, J. B. Kendall, Washington; 131, Lancaster Forge & Blower Company, Buffalo, N. Y.; 150, Manning, Maxwell & Moore, New York; 151, Montgomery & Co., New York; 159, Niles-Bement-Pond Company, New York; 160, New Jersey Foundry & Machine Company, New York; 161, Northern Electrical Mfg. Company, Madison, Wis.; 168, J. Edward Ogden Company, New York; 172, Oliver Machinery Company, Grand Rapids, Mich.; 176, Platt Iron Works Company, Dayton, Ohio; 179, Prentiss Tool & Supply Company, New York; 184, S. M. Price Machinery Company, Norfolk, Va.; 195, J. B. Roache, Brooklyn, N. Y.; 200, H. A. Rogers Company, New York; 202, P. H. & F. M. Roots Company, Connersville, Ind.; 215, Sherman-Brown-Clements Company, New York; 218, Sanson & Rowland, Philadelphia, Pa.; 219, B. F. Sturtevant Company, Hyde Park, Mass.; 231, Smith-Cortney Company, Richmond, Va.; 238, Stow Mfg. Company, Binghamton, N. Y.; 251, Toledo Machine & Tool Company, Toledo, Ohio; 260, Vandyck-Churchill Company, New York; 261, Vermilye & Power, New York; 266, Henry R. Worthington, New York.

Schedule No. 561.

Class 1. One plain dry grinder—Bidder 101, $320; 103, $325 and $400; 107, $359; 161, $325.

Class 2. One plain dry grinder—Bidder 101, $290; 103, $300 and $400; 107, $359; 161, $300.

Class 3. One double crank press—Bidder 19, $3605; 66, $2615; 101, $3045; 251, $2250.

Class 4. One patent head lathe—Bidder 101, $1306; 107, $1510; 159, $1396.

Class 5. One die slotting machine—Bidder 54, $525; 89, $565.

Class 6. One metal cutting circular saw table—Bidder 101, $315.

Schedule No. 562.

Class 11. One motor driven cold metal sawing machine, two saw blades and one saw grinder—Bidder 215, $1249; 260, $1457.

Schedule No. 563.

Class 21. Three screw cutting engine lathes—Bidder 76, $1050; 159, $1050.

Class 22. One upright drill press—Bidder 76, $124.50; 159, $85; 172, $136.55.

Class 23. One wood trimmer—Bidder 150, $139.

Schedule No. 564.

Class 31. One power trimming press—Bidder 19, $1125; 66, $1448; 251, $975.

Class 32. One steam hammer—Bidder 72, $805; 150, $798; 159, $844; 179, $823.

Class 33. One pattern maker's wood lathe—Bidder 79, $376; 150, $590; 172, $650; 179, $385.

Class 34. One pattern maker's wood lathe—Bidder 79, $380; 150, $625; 172, $647; 179, $425.

Class 35. One revolving derrick, to be mounted on a lighter—Bidder 110, $7490.

Class 36. One centrifugal pump—Bidder 18, $786.50; 113, $1025; 168, $453; 176, $1008; 231, $1192; 261, $652; 266, $1072.

Class 37. One hand planer and jointer—Bidder 79, $215; 150, $413; 172, $415.

Class 38. One band saw and attachments—Bidder 150, $376; 172, $419.

Class 39. One combination rip and crosscut sawing machine—Bidder 10, $325; 172, $347.

Class 40. One automatic power band saw setter—Bidder 172, $126.70.

Schedule No. 565.

Class 41. One copper pipe bender—Bidder 85, $934.50; 200, $921.

Class 42. One cutter and reamer grinder—Bidder 24, $241.70 and $287.45; 28, $562; 76, $215; 231, $600.

Class 43. Two drilling outfits and one portable hand drill—Bidder 85, $370; 98, $396.05; 150, $395; 238, $324.05.

Class 44. One wire feed screw machine—Bidder 24, $526.

Schedule No. 567.

Class 61. Two rotary blowers—Bidder 202, $2065; 219, $4260.

Class 66. Hydraulic jacks—Bidder 20, $142.32; 67, $123.90; 82, $180; 103, $121.50; 117, $134; 150, $125; 195, $110.17; 200, $122.18.

Schedule No. 568.

Class 85. Five hydraulic jacks—Bidder 67, $269.30; 82, $209.50; 117, $282; 150, $212; 195, $260.56; 200, $257.94.

Class 89. One valve reseating machine—Bidder 20, $325; 66, $325; 67, $325; 82, $325; 85, $325; 103, $325; 150, $325; 195, $325.

Schedule No. 591.

Class 240. One handy billy pump—Bidder 114, $74.95; 146, $94; 150, $23; 151, $87; 187, $112.

Class 241. One valve reseating machine—Bidder 66, $325; 85, $325; 150, $325; 151, $325; 184, $325; 187, $325; 215, $325; 218, $325.

Class 243. One pneumatic drill and hammer—Bidder 62, $145; 108, $123; 109, $127.50 and $142; 151, $144.

Schedule No. 592.

Class 307. Thirty hydraulic jacks—Bidder 85, $1170; 97, $703.30; 117, $1308; 150, $1120.60; 151, $1194; 160, $1249.10; 184, $1099; 195, $1049; 200, $1173.85; 218, $1198.

Class 308. Twenty-five portable rivet forges—Bidder 26, $180; 117, $168.75; 131, $125; 151, $140; 218, $198.

The following awards have been made for machinery for the Isthmian Canal Commission, bids for which were opened May 10, circular No. 306:

Niles-Bement-Pond Company, New York, class 1, one hydraulic wheel press, $945.

Dean Steam Pump Company, New York, class 2, six feed pumps, $1238.10.

Fox Bros. & Co., New York, class 3, six grinders, $218.48.

Whiting Foundry Equipment Company, Harvey, Ill., class 5, one foundry cupola, $820.

The following awards have been made for machinery for the navy yard, under opening of May 22:

Niles-Bement-Pond Company, New York, class 25, two engine lathes, $1312.

Prentiss Tool & Supply Company, New York, class 26, two engine lathes, $2946.

Under opening of June 5 for supplies for the navy yards the Chicago Pneumatic Tool Company, New York, has been awarded class 194, one sand blast machine, $225; Continental Iron Works, Brooklyn, N. Y., class 195, six corrugated steel furnaces, $1626.

Under opening of June 12 for supplies for the navy yards the Pratt & Whitney Company, Hartford, Conn., has been awarded class 191, one cutting off machine, $675.

The Isthmian Canal Commission has awarded the contract for two sea going suction dredges to the Maryland Steel Company, Sparrows Point, Md., at its bid of $362,000 each.

Trade Publications.

Centrifugal Gas Blowers and Exhausters.—B. F. Sturtevant Company, Boston, Mass. Bulletin No. 133. This pamphlet of 16 pages, a recent issue in the Sturtevant Engineering Series, illustrates Sturtevant centrifugal gas blowers and exhausters installed in a few of the best and largest gas plants in the country. It contains a valuable table showing the various sizes and capacities of blowers and exhausters designed for gas plant work.

Quarrying Machinery.—Ingersoll-Rand Company, 11 Broadway, New York. Circular form 60A. Refers very briefly to various machines operated by compressed air which are particularly adapted for quarrying.

Electric Circuit Breakers.—Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass. Bulletin No. 603. Describes and illustrates three types of carbon break circuit breakers, known respectively as types C-16, C-7 and C-11. Price-list is appended.

The Dominion Iron & Steel Company.

The annual report of the Dominion Iron & Steel Company for the fiscal year ending May 31, issued in the past week, states that the directors consider that satisfactory progress has been made. The profit and loss account shows earnings that, after payment of all interest charges and of the sinking fund on the first mortgage bonds leave a surplus of $652,594, practically all earned since October. The company derived from bounties during the year $638,652.84. On the reduced scale of the coming year, if the average production of the past six months is maintained, they would amount to $491,605. The directors have applied to the Government for an extension of the bounties. The hope is expressed that before long the Canadian mills will be able to manufacture the wire which is now imported and thereby provide a market for the company's full production of rods. The report notes that considerable progress has been made in improvement and completion of the plant. The principal work done in the year has been the installation in the power station of two additional generators of 600-kw. each; the completion of 100 additional coke ovens; the installation of mining machinery at Wabana for underground work and the erection of trestles for handling and storing coal at the open hearth and the washing plant. Preparations are being made for the use of the duplex process in steel making. A Bessemer converter will be installed for the preliminary treatment of pig iron, in order thereby to shorten the open hearth process, which would increase the tonnage of open hearth steel. It is expected that this will be ready early in 1907.

The report for the fiscal year ended May 31 shows: Profits on sales, $1,396,570; rents, &c., $9,736; total receipts, $1,406,306; interest on first mortgage bonds, $390,821; interest on second mortgage bonds, $122,572; interest on current loans, $181,139; total interest charges, $694,532; balance, $711,774; sinking fund first mortgage bonds, $59,179; surplus, $652,595; previous surplus, $1,021,709; total surplus, $1,674,304. The balance sheet for the fiscal year is as follows:

Assets.

Property and construction		$35,628,342
Cash, accounts receivable, &c.	$1,302,410	
Raw materials	250,539	
Manufactured products	402,925	
Warehouse materials	274,932	
Materials in process, &c.	220,403	
Taxes, insurance, &c., paid in advance	11,436	
Special deposits at Montreal	317,847	
		2,780,492
Profit and loss account, debit balance		369,113
Total		$38,777,947

Liabilities.

First mortgage bonds	$7,811,000	
Second mortgage bonds	2,178,000	
Cape Breton real estate bonds	55,833	
		$10,044,833
Interest accrued on first mortgage bonds	$162,729	
Interest accrued on second mortgage bonds	23,906	
		186,635
Bills payable	$2,963,569	
Accounts payable	292,757	
		3,256,326
Sinking fund	$110,695	
Relining and replacement funds	152,621	
Suspense account	26,837	
		290,153
Total		$13,777,947
Capital account, common stock	$20,000,000	
Capital account, preferred stock	5,000,000	
		25,000,000
Total		$38,777,947

The total sales for the year were as follows: Pig iron, 25,393 tons; billets and blooms, 17,145 tons; rails, 101,245 tons, and wire rods, 45,553 tons.

From the offices of the Lake Shore & Michigan Southern Railway at Chicago a statement was given out last week relative to the wreck of the Twentieth Century Limited on Saturday night, June 16, saying that the investigations of Assistant Chief Engineer Cleveland and Assistant General Superintendent Bernet show that "the accident was due to a broken rail supposed to have been caused by a structural flaw in the steel."

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HARDWARE

SOME manufacturers of Hardware and other goods are finding it profitable, in meeting the present great strain upon their producing capacity, to have work done in larger quantity than heretofore in other shops. One of the large skate manufacturing companies, for example, estimates that about as many men are employed upon its products outside of its works as in them, which practically doubles its producing capacity, with no more than a normal increase of factory capacity. Probably the actual cost of production is greater under such conditions than it would be were the entire product turned out in the company's plant. The outside factories must, of course, take their share of the profit.

There are some disadvantages in connection with this method of producing goods besides the fact that the outside factories must take their share of the profit. Especially in busy times there is frequently difficulty in getting outside work done as promptly as is desired, the plants in question being already fully occupied. On the other hand, however, the manufacturer who adopts this method is enabled to take much better advantage of a special and unexpected demand for his product and to make the most of opportunities which in many instances could hardly have been anticipated.

This ability to expand the volume of the output is of especial value in connection with many seasonable products, those whose sale is dependent upon cold or hot weather, for example, in which deliveries cannot be delayed, as the goods must be in the jobbers' storerooms or the retail stores in good time else they become unsalable. Such lines of manufacture differ greatly from staple articles, which are always in demand, and from machine tools, where deliveries may be placed a year ahead without killing the demand—in fact, whetting it in some cases. There are, of course, many kinds of goods which cannot be handled to advantage outside of the home works, where special methods reduce cost far below the price at which a jobbing shop could do the work. Where, however, outside help of this sort can be enlisted to advantage it accomplishes much the same result as would be obtained by a very material increase in the size of the plant, an increase beyond the demand of an average of years, and consequently an abnormal one. Taking into consideration the loss which comes where a large part of a factory is idle a part of the time the additional cost of purchasing a portion of a product from outside sources is not so important an element as it might seem to be at first glance.

Condition of Trade.

The approach of the completion of the half year brings with it attention to many of the larger interests of manufacturers and merchants, as there is a review of the six months' activity and a careful study of conditions and tendencies. Fortunately in most cases the business of the year thus far has been exceedingly satisfactory, certainly in volume, and presumably in nearly all instances in profit. Salesmen are being withdrawn from the road and many conferences held between them and their principals. Questions of future policy come in for consideration, and in this connection plans are not infrequently formed for enlargement of plants and warehouses, with a view to meeting more adequately the demands of the trade and occupying the constantly enlarging place in the market, which is the ambition of the typical American manufacturer and merchant. As usual at this season merchants are not buying very freely for early delivery, their purchases being confined to goods which they must have to keep up their stocks or to meet the immediate requirements of their customers. Most of the factories, however, are behind their orders, and the shops show few indications of the stagnation which sometimes comes at this time. There is thus little opportunity for the accumulation of stocks in the warehouses of the manufacturers, who are hoping that July and August, even with some relaxing of the pressure in production, will give an opportunity to accumulate goods for the fall demand. The market continues firm, with occasional announcements of advances and only here and there weakness which is noticeable. In general the half year draws to a close under exceptionally favorable conditions, with promise of good business during the coming months.

Chicago.

Consideration is already being given to the marketing of many products for spring and summer requirements next year by Western Hardware manufacturers, and prices will soon be established for presentation to the large distributers. With few exceptions the level of values on these future contracts will be on a higher basis than prevailed a year ago, although there is no indication of any advance on Wire Cloth by the leading manufacturers above the abnormally low basis which applied this season. Considering the present cost of raw material, probably none of the producers has a profit to show for his year's efforts, and many will be compelled to face a loss. The general crowded condition of the factories throughout this year will lead to increased production in all lines, one Lawn Mower company having decided to increase its output for 1907 from 60,000 to 100,000. While the sales of Wire for industrial purposes have been abnormally heavy this month, the Hardware trade has not figured prominently in determining the volume, and while concessions of $1 a ton are being freely made on Nails, a basis has not been established that will induce the large jobbers to cover. That the retail trade continues unusually heavy, notwithstanding the season, is shown by the numerous filling in orders for seasonable goods that are being daily received and which in many instances are difficult to fill, on account of the crowded condition of all manufactories. Practically all makers of Edge Tools are behind in deliveries from two to three months, and there is no apparent decline in the demand for Builders' Hardware. Shipments of Nuts and Bolts also continue to be deferred and all concession has been withdrawn. The recent advance in Sheets has greatly strengthened the Stamped Ware market, and anticipating higher prices, jobbers and merchants are buying heavily. Sheet Zinc has again advanced, owing to the increased cost of raw material, and recent price changes indicate that the makers are holding their selling basis more closely to the cost of spelter than heretofore.

NOTES ON PRICES.

Wire Nails.—There is evidence of the usual falling off in the requirements of the trade which occurs at this time of the year, but notwithstanding this there is a seasonable demand, which is somewhat ahead of last year. Some curtailment of the output of mills has been caused by the failure to get steel as promptly as required. While the market is generally quite firm, concessions of 5 cents per keg from regular quotations are obtainable,

perhaps a little more readily than heretofore. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in ten days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—Local demand for small lots from store is moderate. Quotations for small lots from store are on the basis of $2.10 to $2.15 per keg.

Chicago.—The irregularity in prices reported in these columns last week continues and concessions of $1 a ton on Nails as well as Smooth Fence Wire are limited to a few independent manufacturers, who are anxious to operate their plants at their capacity. The seasonable falling off in the demand for Wire Nails is noted, although the consumption shows a healthy increase over this period last year. The sales of the leading interest of all kinds of Wire products thus far this month have been very heavy, and the total almost equals the tonnage booked during the same period in May. Stocks of large distributers are light, especially in Nails, and heavy replenishing shipments will be made early in July from all of the mills. Official quotations are as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Stocks of Wire Nails held by the mills and also by jobbers are lighter than usual at this season of the year. Some of the mills are still having trouble in getting prompt deliveries of steel, and for this reason output is being curtailed to some extent. There is a fair seasonable demand and shipments by the mills on new orders and on contracts are quite heavy. The tone of the market is quite firm, but in some cases concessions of not over 5 cents a keg are obtainable on desirable orders. We quote: Wire Nails, $1.85 in carloads to the large jobbing trade and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in ten days.

Cut Nails.—At a meeting of the Cut Nail Association, held to-day (Wednesday), existing official prices on Steel Nails were reaffirmed on a basis of $1.80 for carload lots, f.o.b. Pittsburgh. A fair amount of new business is being done by the mills, but they are largely employed on filling contract orders.

New York.—Orders for small lots from store are moderate in volume, and are confined to immediate requirements. Quotations for small lots from store are on the basis of $2 to $2.05 per keg.

Chicago.—Although some tonnage in the way of small orders is being taken on new business, the bulk of the trading consists in specifications on old contracts, which are fairly heavy. Quotations are as follows: Steel Cut Nails in car lots, $1.90 to $1.95; less than car lots, $2; Iron Cut Nails, $2 to $2.05 in car lots; less than car lots, $2.10.

Pittsburgh.—The mills are running mostly on specifications on contracts, and a fair amount of new business is being placed. The tone of the market is fairly strong, and the mills are endeavoring to limit output of Cut Nails to meet actual demand as far as possible. We quote Cut Nails at $1.75, base, f.o.b. Pittsburgh, for carload lots, and $1.85 in less than carload lots. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

Barb Wire.—A good proportion of the present demand comes from the railroads and comparatively little from the Hardware trade. It is understood that for desirable orders concessions from regular quotations of 5 cents per hundred pounds are sometimes obtainable, otherwise the market is reported as firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Galv.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—Demand is limited almost entirely to railroad requirements, Western roads specifying freely for material to be used on extensions that are now under way throughout the West and Northwest. No noteworthy improvement in the demand from agricultural communities is anticipated before the fall months. Quotations are fairly well maintained, as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60. Staples, Bright, in car lots to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—We note a fair seasonable demand, and specifications from railroads are coming in quite freely. The tone of the market is fairly strong, but concessions of about 5 cents per hundred pounds on official prices are sometimes obtainable for desirable orders. We quote: Painted Barb Wire, $2, and Galvanized, $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in ten days.

Smooth Fence Wire.—Just at present demand is comparatively light, but it is anticipated that large contract orders will soon be placed by fence manufacturers. From manufacturers of other Wire products contracts have been already placed, covering requirements for some time ahead. Reports of occasional shading of official prices 5 cents per hundred pounds are heard, otherwise the market is quite strong. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Fence manufacturers throughout the country are now preparing to close contracts with the wire mills for their year's requirements from July 1. It is estimated that the total tonnage that will be purchased from the mills during this period will easily aggregate 190,000 tons. The bulk of this business will be placed at prevailing quotations, although it is possible that concessions of $1 a ton may be made by some of the independent manufacturers. The contracts for wire for other industrial purposes, including the manufacture of Springs, Tempered Wire, etc., for 12-month requirements, dating July 1, have been practically all placed and reach a round tonnage. Providing fence manufacturers contract as freely as could be anticipated the tonnage that will be booked by the mills this month will surpass the totals of the fall months last year. Prices continue to be well maintained, as follows: To jobbers, $1.85, f.o.b. Chicago, in car lots, and car lots to retailers, $1.90.

Pittsburgh.—Demand from fencing manufacturers is rather light, but orders from other consumers of Fence Wire are coming in quite freely. Prices are fairly well maintained, but occasionally are shaded 5 cents per 100 pounds to some points of delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Washers.—Prices on Washers continue to show weakness, the larger manufacturing interests having declared the market open, although it is probable that they are not responsible for the lowest current quotations. These apparently come from concerns with whom Washers are not a leading line, but who turn out a few in using up odds and ends of stock. Quotations of 6.00 to 6.20 off list are commonly reported, but it is understood that lower figures are named.

Planes.—An advance of about 20 per cent. in the prices of iron and wood bottom Planes has been made, notice of the withdrawal of quoted prices having been

made under date of June 23. The discount to average trade is now 60 and 10 per cent. on the list used by Sargent & Co., Union Mfg. Company and Ohio Tool Company, all of whose prices are on the same basis. The present price represents an advance of 20 per cent. over the former discount of 70 per cent. To the larger buyers there is a concession from this price. The Stanley Rule & Level Company, whose list is on a different basis, has made no change in price as yet. The same is true of Tower & Lyon Company, manufacturer of Chaplin's Improved Planes.

Conductor Pipe and Eaves Trough.—As stated last week in these columns the market for Conductor Pipe and Eaves Trough has undergone some changes both as regards prices and territorial limits. Following are the discounts now ruling, which are subject to the usual terms of 60 days, or 2 per cent. discount for cash in ten days. The discounts to be applied are determined by the territory in which the point of destination is located:

	Eastern territory. Per cent.	Central territory. Per cent.	Western territory. Per cent.	Southern territory. Per cent.	Southwestern territory. Per cent.
Conductor Pipe:					
Galv. Steel, standard sizes and gauges.	60-30	70	65-10	65-10	62½-7½
Galv. Steel, irregular sizes and gauges.	75-2½	70-15	70-10	70-10	70
Gal. C. C. Iron, stand. sizes and gauges.	60-2½	55-7½	55-2½	55-2½	50-5
Gal. C. C. Iron, irreg. sizes and gauges.	75-2½	70-15	70-10	70-10	70
Copper, 14, 16 and 20 ounce	40-10	40-7½	40-5	40-5	40-2½
Eaves Trough:					
Galv. Steel, standard sizes and gauges.	80	75-10-7½	70-20-7½	70-20-7½	70-20
Galv. Steel, irregular sizes and gauges.	75-5	75	70-10	70-10	70
Gal. C. C. Iron, stand. sizes and gauges.	70-5	70	60-15-2½	60-15-2½	65-2½
Gal. C. C. Iron, irreg. sizes and gauges.	75-5	75	70-10	70-10	70
Copper, 14, 16 and 20 ounce	40-10	40-7½	40-5	40-5	40-2½
Miters, End Pieces and Drops:					
Galvanized Steel	35	35	35	35	35
Galv. Char. Iron	List net	List net	List net	List net	List net
Plain Ridge Roll and V. Ridge Cap:					
Galvanized Steel	80-10	80-5	75-10-7½	75-10-7½	75-10
Galv. C. C. Iron	70-12½	70-5	65-10	65-10	65-2½
Formed Valley:					
Galvanized Steel	70-7½	70-2½	65-10	65-10	65-2½
Galv. C. C. Iron	60-2½	55-7½	50-10	50-10	50-2½
Elbows and Shoes:					
Galv. Steel, C. C. Iron or Tin:					
Standard gauge	60-10	60-10	60-10	60-10	60-10
No. 26 gauge	50	50	50	50	50
No. 24 gauge	25	25	25	25	25
No. 22 gauge	10	10	10	10	10
Special or hand-made	60-10	60-10	60-10	60-10	60-10
Copper	50	50	50	50	50
Wire Eaves Trough Hangers	33⅓	33⅓	33⅓	33⅓	33⅓
Steel Hangers—					
Standard list	20	20	20	20	20

TERRITORIAL LIMITS.

UNDEFINED TERRITORY.

Territories not defined below will take the prices for Central Territory with freight allowed to any one of the following points through or nearest which shipment must pass to reach destination: Joplin, Mo.; Nevada, Mo.; Kansas City, Mo.; St. Joseph, Mo.; Omaha, Neb.; Sioux City, Iowa; St. Paul, Minn.; Minneapolis, Minn.

EASTERN TERRITORY.

The Eastern Territory consists of the New England States, the States of New York, New Jersey, Delaware, Maryland, Pennsylvania, Virginia, West Virginia, Kentucky, Ohio, Indiana, Illinois, Michigan except the Northern Peninsula, and the city of Milwaukee in Wisconsin.

CENTRAL TERRITORY.

The Central Territory consists of the States of Missouri, Iowa, Wisconsin except the city of Milwaukee, the Upper Peninsula of Michigan, and that part of the State of Minnesota lying south and east of the Minneapolis, St. Paul & Omaha Railroad from a point on the Iowa State line near Worthington to Minneapolis and St. Paul and south and east of the St. Paul & Duluth Railroad from Minneapolis to Duluth, also the cities of Sioux Falls, S. D.; Charleston, S. C., and Savannah, Ga.

SOUTHERN TERRITORY.

The Southern Territory consists of the States of Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Tennessee, except the cities of Charleston, S. C., and Savannah, Ga., and including the cities of New Orleans, La.; Galveston, Texas, and Houston, Texas.

WESTERN TERRITORY.

The Western Territory consists of the States of Kansas and Nebraska.

SOUTHWESTERN TERRITORY.

The Southwestern Territory consists of Indian Territory and Oklahoma, the States of Louisiana, Arkansas and Texas, except the cities of New Orleans, La.; Galveston, Texas, and Houston, Texas.

It is stated that cities or towns situated on territorial boundary lines take the price of the territory that may be the lowest; for example, all places located on the west bank of the Mississippi between Cairo, Ill., and Dubuque, Iowa, take Eastern territory prices. As regards freight allowance, the following details embodying some changes are announced:

FREIGHT ALLOWANCE—ON ALL ARTICLES EXCEPT ELBOWS AND HANGERS.

No freight shall be allowed on shipments of less than 250 lineal feet.

On shipments of 250 lineal feet or more full freight may be allowed to all points in defined territories.

On shipments to points in undefined territories, of 250 lineal feet or more, freight may be allowed to the common point on western boundary line of defined territory through or nearest which it passes to reach destination.

ON ELBOWS.

Actual freight allowed on shipments of 25 dozen or more to all points in the following described territory: Commencing at the mouth of the Mississippi River, following that stream in a northerly direction to a point on the southern boundary line of the State of Missouri; the States of Missouri, Iowa and that portion of the State of Minnesota lying south and east of the Minneapolis, St. Paul & Omaha Railroad from a point on the Iowa State line near Worthington to Minneapolis and St. Paul and south and east of the St. Paul & Duluth Railroad from Minneapolis to Duluth, and all that part of the United States lying east of same, with the exception that freight may be allowed on shipments of 12 dozen or more to points in the following States—viz., Pennsylvania, Maryland, Delaware, New Jersey, New York and all the New England States. No freight allowed on shipments of smaller quantities than those defined in the respective territories, and an extra charge to cover cost of crating and cartage on such smaller shipments will be made.

On shipments of Elbows alone freight may be allowed as per Elbow Sheet of December 11, 1905.

On shipments of Elbows in connection with Pipe, Trough, Ridge Roll or Formed Valley, the rule applying to shipments of Pipe, &c., will apply.

ON EAVES TROUGH HANGERS.

On shipments of Steel and Wire Hangers alone consisting of 10 gross or more, full freight may be allowed. On shipments of Steel and Wire Hangers in connection with Conductor Pipe, Eaves Trough, &c., full freight may be allowed, provided such shipment of Pipe and Trough is of sufficient quantity to take full freight allowance. All other shipments, no freight allowance.

Sheet Zinc.—Under date of June 18 announcement is made of the advanced price of $7.90 per 100 pounds on Sheet Zinc in 600-pound casks of the thicknesses from Nos. 9 to 22, inclusive, of the widths from 32 to 58 inches, inclusive, and of the lengths from 72 to 96 inches, inclusive, delivered, f.o.b. cars, mill. This price is subject to discounts, as follows:

	Cash with order. Per cent.	Quantity. Per cent.	Total. Per cent.
Carload lots	3	5	8
9000-pound lots	3	3	6
6000-pound lots	3	2	5
3000-pound lots	3	1	4
Less than 3000 pounds	3	0	3

Rope Ties.—The market for horse and cattle Rope Ties and Rope Leads, made by Sargent & Co. and Covert Mfg. Company, has been characterized for some time by much irregularity. The price has recently been advanced on the line, the increase, which is not uniform, ranging from 10 to 20 per cent. on the various sizes and kinds.

Paris Green.—The base price of 21 cents remains unchanged. Demand continues fair and is considered satisfactory for the season. Quotations are as follows, on 5 tons and over:

Arsenic kegs	21 c.
Kegs, 100 to 175 pounds	21½c.
Kits, 14, 28 and 56 pounds	22½c.
Paper boxes, 2 and 5 pounds	22½c.
Paper boxes, 1 pound	23 c.
Paper boxes ½ pound	24 c.
Paper boxes, ¼ pound	25 c.

Terms, 30 days, f.o.b New York.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds	½c.
1000 to 5000 pounds	1c.
500 to 1000 pounds	1½c. to 2c.
Less than 500 pounds	2c. to 3c.

Rope.—Business continues good, including orders for current demand and for forward shipment. Owing to cheaper Sisal Hemp, quotations on Sisal Rope are somewhat lower. Quotations are as follows. Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9 cents; No. 2 quality, 7¾ cents per pound.

Window Glass.—Window Glass factories which were in operation the first of the week have remained in blast owing to favorable weather conditions, although the June output is usually not large enough to affect the market to any considerable extent. The demand generally is light in the East, while in the middle West and on the Pacific coast the activity is reported as being greater. Quotations from jobbers' list in this section are as follows: Greater New York, single, 90 and 5; double, 90 and 10

per cent. discount. Eastern district, except the Boston district, 90 and 10 per cent. discount for all sizes of single and double strength. In the Boston district quotations are reported as being 90 and 15 for all sizes of single and double strength.

Linseed Oil.—The market is dull and little or nothing is being done in a large way. An enormous business was done by the crushers last winter. Contract orders which would usually have been placed in March and April were given two or three months earlier, so there was practically no spring business. The demand has not been as large as was anticipated and buyers have not been in a position to accept deliveries when due, so that no large buying movement is anticipated in the near future. Local demand for jobbing lots is but fair. Quotations are as follows, according to quantity: City Raw, 39 to 40 cents per gallon; out of town Raw, 36 to 38 cents per gallon. Boiled Oil is 1 to 2 cents per gallon over Raw.

Spirits Turpentine.—The market has fallen off about ½ cent per gallon at this point during the week. Demand is light, being confined to immediate requirements. New York quotations are as follows, according to quantity: Oil Barrels, 60½ to 61 cents; Machine made Barrels, 61 to 61½ cents per gallon.

INLAND EMPIRE ASSOCIATION AND ITS PEDDLERS' CAMPAIGN.

IN our last issue we referred briefly to the campaign which has been initiated by the members of the Inland Empire Implement and Hardware Dealers' Association for the extermination of "buggy trailers" and "range peddlers" from the territory covered by the membership of the association. What is styled the "Peddlers' Association" has been formed, the expenditures of which will be borne by a large fund which has been raised by the 200 members of the association, who have been assessed $20 each, and which will be further augmented if necessary. Jobbers of Steel Ranges and Vehicles have co-operated with the retail Hardwaremen in this fund and have sent in a number of $100 subscriptions, in several cases an intimation accompanying the checks to the effect that "there is more where this came from."

The plan of the Peddlers' Association is referred to as follows:

As soon as a peddler of either Buggies or Steel Ranges enters a town the local dealers in that town get out their teams and wagons, load them with goods as good or better than the peddlers' and then when the peddlers start out the local men follow them. When the peddler drives into a farmyard the local men "butt in" and show Mr. Farmer that he can save from 25 to 40 per cent. by buying goods of the home dealer—any home dealer, for the association does not aim to sell goods for any particular dealer. While all this is going on the secretary of the Inland Empire Association sends men from headquarters to relieve the local merchant, so that he can return to his business, and the paid agents of the association take up the work where the local merchant left off and stay with the peddlers until the latter give up the game and leave the territory which the association has undertaken to protect.

The campaign thus far, we are advised, has been very successful, and in one instance where buggy peddlers were followed for three weeks they sold but three rigs, and these at prices very much under those which they expected to obtain. One rig for which $165 was asked was finally sold for $75, and another for which $140 was asked was knocked down for $98.

To quote E. W. Evenson of Spokane, the energetic secretary of the Inland Empire Association, "whether the peddlers have a longer sack than the merchants remains to be seen, but one thing has been proven and that is, that they (the peddlers) cannot sell their wares while a representative of the local merchant is on the ground."

W. Y. Perkins has opened a new store in Soldier, Ida., and will carry Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Engines, Wind Mills, &c.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

HENRY DISSTON & SONS, Philadelphia, Pa.: Catalogue and circular illustrating Cross Cut Saws, Cross Cut Saw Tool, Saw Handles and Files.

THE EDWARDS MFG. COMPANY, Cincinnati, Ohio: Catalogue illustrating an extended line of Metal Ceiling and Side Wall Designs.

W. R. OSTRANDER & Co., 22 Dey street, New York: Circulars devoted to Incandescent Lamp Replacers and Cleaners, Electric Lighting Appliances, Adjustable Fixtures for use in factories, shops, schools and drafting rooms, Oscillating Fan Motors and Fans, &c.

PATTERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York: Catalogue relating to Screws, Bolts, Expansion Bolts, Steel Taper Pins, Turnbuckles, Thumb Screws and Nuts, Threaded Wire, Nuts, Rivets, Safety, Ladder and Jack Chain, Washers, Spring Cotters and Keys, Coil Chains, Cut and Wire Nails, Tacks, &c.

THE DOVER MFG. COMPANY, Canal Dover, Ohio: Catalogue illustrating Asbestos Sad Irons, including Laundry Sets, Pressing Iron, French Set, Shirt Waist Set, Flounce Set, Sleeve Iron, Polishing Iron, Tourist Set, Asbestos Family Cabinet, Laundry Cabinet and French Set Cabinet.

THE PENN METAL CEILING & ROOFING COMPANY, Twenty-third and Hamilton streets, Philadelphia, Pa.: Thirty-fifth series Metal Ceiling and Metal Side Wall catalogue, showing Metal Sectional Ceilings and Side Wall Decorations.

THE MORRISON MFG. COMPANY, Fort Madison, Iowa: Catalogue 6, representing the Morrison Line of Gang, Sulky and Walking Plows, Listers, Cultivators, Harrows, &c.

PULLMAN MFG. COMPANY, Rochester, N. Y.: 1906 catalogue of more than 100 pages relating to Sash Balances, Ball Bearing Floor Spring Hinges, Coil Door Springs, Door Checks, Door Holders, Ventilating Sash Locks, Sash Pulleys, Sash Cord, Ribbons, Chain and Attachments; Automatic Ventilators, Garment Hangers, &c. The company is now making over 2400 different Sash Balances and is in a position to furnish balances for any shape, style or size of Sash or to meet any required conditions of Sliding Sash.

WM. AYRES & SONS, Cumberland street, Philadelphia, Pa.: Catalogue devoted to Horse Hats, Dusters, Spring and Fall Robes, Steamer Rugs, Automobile Robes, Horse Sheets, Horse Covers, Halter Cow Covers, Cooling Blankets, Sweat Blankets, Sweat Hoods, Riding Saddle Housings, &c.

ESTATE OF JOHN DICKINSON, 64 Nassau street, New York: Catalogue of Diamond and Carbon Tools for mechanical purposes.

JOHN E. RILEY, successor to Vogel & Riley, 38 to 42 South Eighth street, Brooklyn: Illustrated booklet referring to Sheet Metal Lamps, Shades, Lanterns, Reflectors and Illuminated Signs.

MOLINE PLOW COMPANY, Moline, Ill.: Catalogue and repair price-list, 341 pages, covering Bean, Corn and Cotton Planters, Cultivators, Drills, Equalizers, Harrows, Listers, Plows, Plow Attachments, Sugar Beet Machinery, &c.

E. P. STOUGHTON, vice-president of the Millers Falls Company, in charge of the business in New York, has arranged to sail on the steamer Vaderland, June 30, accompanied by his daughter, for a two months' tour of Europe, which, as two years ago, will include the more interesting portions of the United Kingdom and the Continent. Mr. Stoughton expects to be back for business early in September, the trip being largely of a recreative character.

GLOBE MFG. COMPANY.

ON January 16 the Globe Mfg. Company, Taunton, Mass., suffered from a severe fire, and in fact the plant was almost a total loss. The rebuilding of the burned portion was at once energetically taken up, and in five weeks a number of machines were running. Since that time the company has continued to make improvements, until now they have exceptionally good facilities for turning out small Wire Nails. The company makes a specialty of all kinds of small Nails where an extra good Nail is desired, or where Nails of special size or shape are required. At the present time about 60 different kinds of Nails for special purposes are made. Escutcheon Pins are also manufactured, a large stock of these being carried. In rebuilding the factory and getting things straightened out the employees worked early and late, and to show its appreciation of their efforts and at the same time give their customers an opportunity to inspect the increased facilities of the plant, the company has invited all to attend a field day on Saturday, June 30. It is proposed to have the inspection of the plant in the morning, when customers will have a chance to see a Wire Nail mill in full operation. Between 12 and 1 o'clock a special car will be taken from the factory to Dighton Rock Park, 6 miles from Taunton, on the banks of the Taunton River, where a genuine Rhode Island clam bake will be served, after which there will be dancing and other amusements on the park grounds.

TRADE ITEMS.

M. C. HANTON, 103 Chambers street, New York, who makes a specialty of all kinds of Keys and Key Blanks suitable for the products of various manufacturers, in addition to handling lines of Builders' Hardware, has just bought the entire remaining stock of Locks, Keys and Builders' Hardware of the Mallory-Wheeler Company, New Haven, Conn. This transaction, however, does not include anything pertaining to Padlocks, which the latter company still continues to manufacture as heretofore.

THE REX FILE & SAW COMPANY, Newcomerstown, Ohio, which has been incorporated under the laws of Ohio, with a capital of $100,000, has succeeded the Jamestown File Works of Jamestown, N. Y. The works and office will be at Newcomerstown, Ohio. The officers of the new company are David D. Lewis, president and general manager; M. Yingling, vice-president; Will A. Beers, secretary, and S. B. Mulvane, treasurer. The company expects to be in a position to ship Files about August 1.

IN connection with their July catalogue, Butler Bros., Chicago, make announcement of further expansion in their business facilities. Soon after July 1 they will occupy the entire six-story and basement building at the corner of Howard and West German streets, Baltimore, as a permanent sample house. In Dallas, Texas, they have leased the building 218-220 Commerce street, with 42,000 square feet of floor space, which will be utilized for the permanent display of their immense line of merchandise. Another warehouse with 250,000 square feet of floor area has been added to the great Chicago plant. In St. Paul they will continue to occupy the entire building at 379-381 Sibley street as a sample house until their new distributing house in Minneapolis is completed in the early months of next year.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass., announces that the No. 80 Gallery Repeating Rifle, which was promised for delivery July 1, will not be ready until September. This delay has been entirely due to labor difficulties, as on March 17 the polishers struck because the company declined to unionize its factory. There was no disagreement as to wages, as the company was paying the full union scale. The company at once set about securing men to fill the strikers' places, and the plant is now running full force and is in even better shape than before the strike.

THE NATIONAL SADDLERY MANUFACTURERS' ASSOCIATION, the Associated Manufacturers of Saddlery Accesories and the Wholesale Saddlery Association of the United States held their annual conventions at the Auditorium, Chicago, last week. It was the fourth convention of the Saddlery manufacturers, the second of the manufacturers of accessories and the eighteenth of the Wholesale Association. The Manufacturers' Association adjourned Friday night after adopting a resolution declaring for the "open shop." The following officers were re-elected: President, Edwin A. Armstrong, Detroit; vice-president, Owen Gathright, Louisville; treasurer, Albert Kuhlmey, Chicago; secretary-commissioner, Henry Othmer, Chicago. The following officers were elected for the ensuing year by the Manufacturers of Saddlery Accessories: President, O. P. Letchworth, Buffalo; vice-presidents, C. G. Fleckenstein, Chicago, and E. Politz, Philadelphia; secretary-treasurer, W. A. Stone, Rochester, N. Y.

A. A. NEWMAN, president of the Newman Clock Company, Chicago, is making a hurried trip to Europe with a view to effecting arrangements for doubling the capacity of the foreign plant, where the movements used in the Newman Watchmen's Clock are made. The Newman Company is working to full capacity, and will be able to further augment its output for both foreign and domestic trade with an enlargement of the European plant.

CONTRACT for the construction of the new wholesale house of the Hurty-Simmons Hardware Company, at Minneapolis, Minn., has been let to the Wurster Construction Company, St. Louis. The building will be 125 feet on Fourth street and 148 feet on Second avenue, and will be seven stories high. It will be equipped with modern warehouse appliances.

SUPERIOR TAP COMPANY, Springfield, Vt., which manufactures a full line of Taps, has made arrangements whereby it will be represented in New York by Benj. S. Alder Company, 37 Warren street, which will carry a full line of samples and a complete stock.

THE HURLEY MACHINE COMPANY, Chicago, has issued a two-leaf circular illustrating its Little Giant Floor Scraper. The pamphlet shows the operation in various phases of work, and comparisons are made of results obtained in hand scraping and with the Little Giant, showing the greatly increased amount of work and greater uniformity accomplished with the machine.

ABOUT July 1 the Dix Mfg. Company, Baltimore, Md., expects to occupy its new plant at 1021-1025 Guilford avenue. New and improved machinery has been installed, equipped with individual electric motors, which will enable the company to meet the increasing demand for its line of Door Hangers. Soon after taking possession of the new plant the company will embark in the manufacture of other Hardware specialties.

THE employees of the Hartford Rubber Works Company recently played a game of baseball at Guttenberg, N. J., the two nines representing, respectively, the Chambers street and uptown branches in New York. The game resulted in favor of the downtown nine by a score of 9 to 0.

The Brown-Williams Company, Marion, Ind., has been incorporated with a capital stock of $50,000 by C. A. Williams of Williams & Son and W. A. Brown, together with M. M. Williams, to do a retail business in Buggies, Harness, Hardware, Implements, Sporting Goods and sheet metal contracting. The new company absorbs the business of Williams & Son and W. A. Brown, and about August 1 will move the stocks of both concerns to a new location secured in the Glass Block, on Third street, where about 25,000 square feet of floor space will be occupied. Officers of the company will be C. A. Williams, secretary and treasurer, and W. A. Brown, president and general manager.

F. V. Alford has purchased a half interest in the Hardware business of A. W. West, in Cottonwood Falls, Kans. The firm is now known as the Alford Hardware Company. Shelf Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, and Sporting and Athletic Goods are carried.

SARGENT & CO.'S CONVENTION.

THE regular convention of the selling force of Sargent & Co. was held at New Haven, Conn., during last week. A pleasant feature of the gathering was the banquet given on Wednesday evening, June 20, at the Pequot House, to which the heads of departments and foremen of the factory were invited to meet the salesmen. The guests were seated at small tables, the company being so arranged that an equal number of factory people and those from out of town were at each table. During the dinner there was music by an orchestra from the company's lock shop, and at its close informal remarks were made by Frank Guildener, who acted as toastmaster; J. B. Sargent, Thomas J. Atkins, E. E. Lord, Henry B. Sargent, R. B. Cherry, John H. Jarvis, George F. Wiepert, Bruce Fenn and John H. Shaw.

These meetings, the motive of which is a mutual exchange of views for the purpose of advancing the production and marketing of the company's goods, have been held for several years. The importance attached to them by the leading officials is indicated by the calling in of so many individuals from such widely separated points. In the gathering were the following men residing in and about New Haven and identified with the factory there:

J. B. Sargent.	E. S. Vinten.	G. T. Smith.
J. D. Sargent.	F. R. Pollard.	B. J. Falsey.
G. L. Sargent.	B. S. Brockett.	W. J. McCoy.
Murray Sargent.	John Perry.	F. J. Ryan.
H. B. Sargent.	F. J. Monz.	F. J. Chatterton.
E. R. Sargent.	M. J. Mara.	A. R. Kirchner.
W. A. Rice.	W. H. Wright.	John Baum.
E. J. Shipman.	C. H. Bradford.	W. E. Edwards.
Bruce Fenn.	J. H. Shaw.	L. J. Kirkham.
F. W. Fellows.	M. F. Griffin.	J. W. Scott.
T. A. Kapitzke.	E. E. Lord.	N. L. Taylor.
F. N. Stevens.	C. H. Cutts.	C. A. Wagner.
Charles Smith.	A. D. Baker.	F. A. Jackson.
J. R. Haldeman.	George Barth.	R. F. Sheppard.
Ernest Koelbl.	Burton Winters.	D. J. Allen.
M. F. Campbell.	E. H. Eggleston.	J. H. Bitterlich.
H. H. Weed.	W. E. Stevens.	R. A. MacArthur.
W. H. Kirschner.	H. F. McCollum.	W. S. Loveland.
A. A. Page.	W. H. Bradley.	John Taylor.
J. A. Hughson.	W. E. Bailey.	S. R. Munson.

The New York contingent comprised the following:

T. J. Atkins.	George F. Ogden.	F. W. Robbins.
John Sargent.	W. I. Thomas.	Howard Abeel.
G. F. Wiepert.	T. C. Fowler.	C. L. Comfort.
J. Fred Wright.	A. T. Oakley.	A. W. Rhinehart.
J. H. Cherry.	E. S. Massey.	John R. Schoemer.
F. L. Stellwagen.		

The out of town salesmen present, covering, as will be seen by the addresses, the various important sections of the United States, each visiting the trade adjacent to the home address, were as follows:

S. C. Ball, Buffalo, N. Y.	H. F. Keller, Saginaw, Mich.
E. F. Brittingham, San Francisco, Cal.	C. J. Smith, Jr., Baltimore, Md.
R. B. Cherry, Albany, N. Y.	C. A. Upham, Columbus, Ohio.
F. L. Cobb, Decatur, Ill.	Morris Wheeler, Newark, N. J.
A. N. Delvey, Harrisburg, Pa.	V. H. Whiting, Chicago.
E. P. Dunning, Chicago, Ill.	Robert E. Hofer, Boston.
Frank Guildener, Baltimore, Md.	Chas. L. Titus, Boston.
F. W. Hughes, Watertown, N. Y.	F. L. Kirschner, Boston.
A. W. Peck, Jr., New Orleans, La.	Jas. Denny, Pittsfield, Mass.
	L. W. Harts'g, Chicago.
	W. N. Thomas, Philadelphia.
	John H. Jarvis, Philadelphia.
	Jesse Harris, Philadelphia.

GEORGE WOSTENHOLM & SON.

GEORGE WOSTENHOLM & SON, LIMITED, Sheffield, England, after having withdrawn from the scissor trade in the United States for over 20 years, owing to the high tariff in this country, have been urged to compete again for this business by representative concerns here. This change of policy is attributed to the demand for high grade goods, as against the flood of cheap German and other products. The Sheffield house, through its branch at 105 Chambers street, New York, is now sending to this country full lines of these goods, including Straight Trimmers, Straight and Bent Nail Scissors, Cuticle, Pocket, Buttonhole, Embroidery and Double Bow Scissors and Coupon or Bankers Shears, in all the various sizes and the latter up to 12-inch lengths and longer if wanted. These goods are described as made of the best Sheffield cutlery steel suitable for Scissors, with the customary Wostenholm finish.

SEWING MACHINES A GOOD LINE FOR THE AGGRESSIVE HARDWAREMAN.

By G. H. D.

THE Hardware merchant who sells Sewing Machines along with his other merchandise is the one who of all in the business needs instruction and whose case is most difficult to meet. Speaking from experience, I know the Hardware merchant is apt to let Sewing Machines speak for themselves. This won't do. People do not yet look on them as Hardware or granite ware.

The Machine Must Be Talked Up

and shown up. The Hardwareman who cannot have a Sewing Machine Department should at least have some one about his place who is competent to use the Machine, show it up, give instructions and do a little repairing. Such men are easily found. Half the young clerks can qualify themselves for the work in a few days, if it is made their business. It is certainly a great mistake for the Hardware dealer to have Sewing Machines standing around with the idea that they will sell themselves. It is also a mistake for him to be offering them as bargains.

Some Hardwaremen look for large returns without much effort. They expect the agency for Sewing Machines to be profitable without the usual requirements of business. The merchant who takes hold of the business with a full understanding that it is simply a good opportunity which he must improve by the legitimate efforts that would bring success in any branch will find Sewing Machines an excellent and profitable line.

Your Own Versus Competing Machines.

First become familiar with your machine, learn its advantages over others, for all machines have some advantages peculiar to themselves; pay particular attention to the strong "talking points." Next, learn all that you can about the other machines that are being sold in your territory, so that when you come in competition, you can explain the superiority of your own. This is legitimate and honorable competition, but to repeat the old song that your rival's is made out of soft material and will not wear, that it is cheaply made, that you or your neighbor had one and it wore out in a year, or any other lie, is dishonorable and an injury to the trade which you as well as your competitor will feel. The idea in a nutshell is to know the strong points of your own machine and the weak ones of your rival's, and to bring them out in a comparison that will be plain and convincing to your customer.

While Favoring Machines

that have an established reputation, I do not advise the handling of such as may be so generally sold in your neighborhood that there is a temptation to cut prices. There are so many good machines that this is not necessary. If you cannot get machines that you can control, you can at least get such as have been kept up to a fair price. The reason for such a course is due to the fact that every Hardware dealer must, more or less, sustain the good reputation of the Machines he sells, and although you have less permanent interest in them, you represent a larger number than the special agent does. In other words, you have more burdens to bear and less pay for your work, and therefore, I say, carry as small a variety as will fully satisfy and meet the requirements of your trade.

Many things can be said to the Hardware dealer in the way of advice, but I know of no definite plan of making Sewing Machine sales. After all, there is nothing like hard work and plenty of it. This will eventually bring results, while any set plans for selling Sewing Machines must vary according to the characteristics of your customers as well as the conditions of your territory.

E. S. Davis has purchased the store of V. H. Shier, in Salem, Neb., and will carry a retail stock of shelf and heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods and Buggies.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

CUTLERY AND TOOLS IN WINDOW DISPLAY.

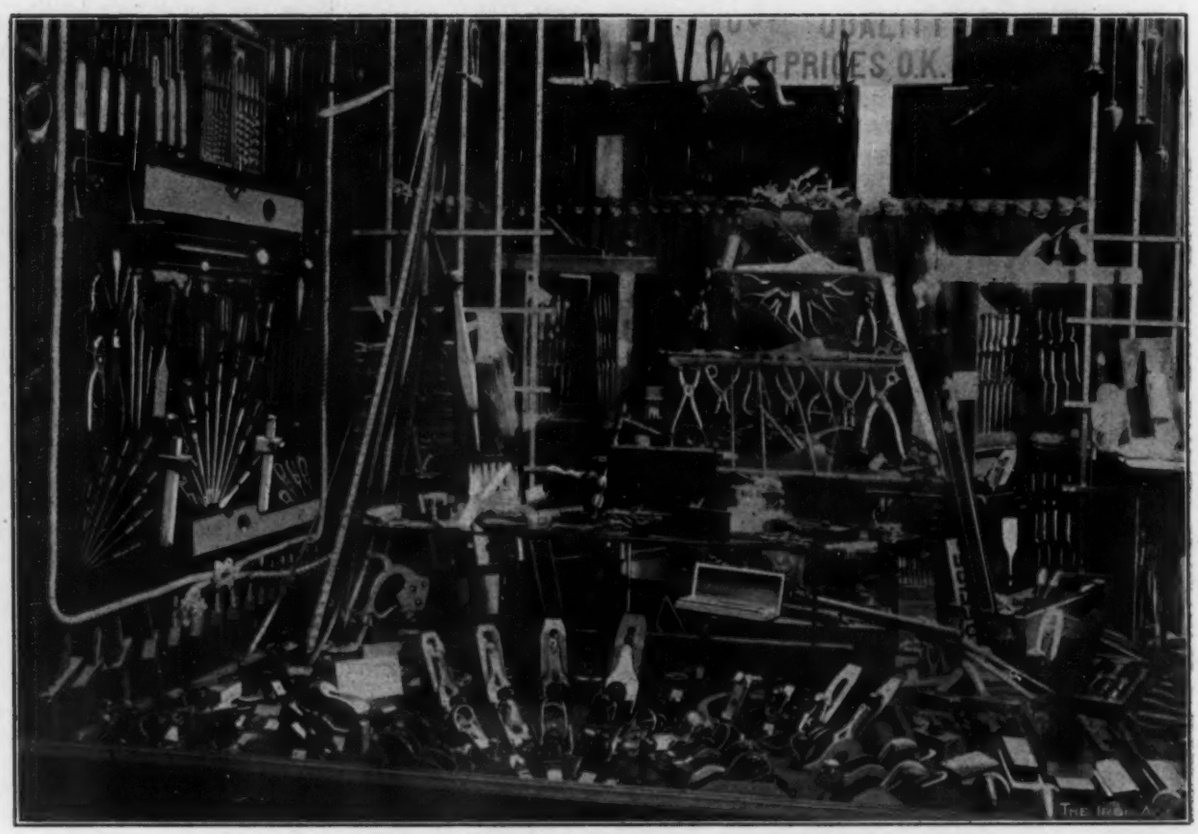
WE illustrate herewith two window displays made by the Ingram Hardware Company, Oakland, Cal., both having been prepared under the supervision of J. M. Jackson. They are striking and effective exhibits of lines which are of more than usual interest to the public. One of the windows was entirely devoted to Cutlery and the picture of the father of his country suggests it as a Washington's Birthday or Fourth of July window. The other window contained a large and impressive assortment of Tools, and proved effectual in securing attention and making sales. In both cases the bottom of the window was covered with green burlap. The pedestal or pyramid consisted of boxes covered with the same kind of material.

Cutlery Window Exhibit of the Ingram Hardware Company.

DEPARTMENTS IN THE HARDWARE STORE.

TRANSIENT customers entering a good sized store are often at a loss to find the particular goods they are in search of. Those who do not visit a Hardware store frequently are likely to be much confused by the multiplicity of familiar and unfamiliar articles stacked on the floor, hanging from the ceiling and packed on shelves and counters without any apparent relation in material or use. Moreover, it is not conducive to good feeling on the part of a customer to walk aimlessly around or be curtly passed from one busy clerk to another before getting what he wants.

In the well stocked and well arranged Hardware store of Rising & Thorne, Newark, N. J., this problem of service is solved in a way which economizes the time and conserves the convenience of patrons. The whole stock is arranged in departments, goods classified under their generic name, as Bolts, or grouped with a view to use, as Machinists' Tools, being kept together in the same section of the store. These sections are marked by large cardboard signs with heavy black letters of a size to be readily seen from any part of the floor, thus:



Ingram Hardware Company's Window Display of Tools.

Machinists' Tools

This enables a customer to locate immediately the line in which he is interested, and go directly to it with the comfortable assurance that he will receive the attention he requires instead of being chased to some remote corner of the building. He does not feel like a stranger in the store, and is more than likely to be satisfied with the service he receives and buy the goods that are shown to him. The following list of the departments into which the store of Rising & Thorne is divided will doubtless be interesting and suggestive to our readers:

Wood and Iron Planes.
Saws.
Carpenters' Tools.
Masons' Tools.
Machinists' Tools.
Builders' Hardware.
Front Door Locks.
Pocket Knives and Razors.
Carvers and Forks, Shears.
Drawing Tools.
Brushes.
Tacks, Screws, Rivets.
Carriage and Machine Bolts.

POINTERS FOR THE HARDWAREMAN.

BY ON-THE-ROAD.

The recording angel of the business world chalks up more failures to lack of self reliance than any other one thing. And more than any other one thing, advertising must have that quality. Originality is but self reliance in "street dress." There can be no great lasting success in treading in another man's tracks. No, indeed. Boldly and alone goes forth the self reliant man. Nothing passive about him. He knows the danger. Self reliance is that which gives executors something to do and the heirs something worth fighting for. Speaking of self reliant princes I am reminded of the liveliest Hardwareman that I know. His town has much to thank him for, for more than any other he has brought money into the community by influencing manufacturing thitherward. He sounds the traveling man, saps the papers, and every time he learns of an about-to-move factory firm he goes right out gunning for big game and using the Board of Trade for his lever. Of course he's making money. One such factory account is worth more money than the rest of the sundries trade of a town put together. I doubt if that man ever sleeps. His business grows and grows, he controls the Builders' Hardware trade, and recently he even figured on a structural iron job, and the Lord knows that's not a Hardware man's stock. But I cite the case only to show what self reliance is worth. Queerly enough, he is a man who doesn't look the part, which again proves that not by looking at a frog's hind legs can one tell how far the frog will jump.

Self Reliance

With the lowering of individual sale profits the great rank and file of the American Hardwaremen (and by American I mean to speak geographically rather than alluding to nationality) have developed to a superb degree the great spirit, the wonderful obstacle annihilating spirit of hustle. As their profits came down their energy has grown, their shoulders have gone to the wheel, and they have pushed and shoved until something gave way, so that what was lost in quality has been equaled in quantity. The Goddess of Merchandising never intended that man should sit idly down and wait for business to come to him. No, just as soon as the gangrene of lethargy set in she touched man in his most vital point—his cash till—and the result was recovery. Many have not survived that gangrene of laziness and their names no longer appear in Bradstreet's or Dun's. But many there are who have been reborn in a business sense, as it were, and to-day their stores show the result of their regeneration, as indeed their incomes must.

Business Regeneration

A hustling retailer with his eye on the trail for new business had been selling a mill in town a good deal of cotton waste, but not in some time had he sold them any. Down to the mill he went one day, with some good cigars in his pocket. He knew the buyer; in fact, they had called each other by their first names ever since childhood. The topic of waste was brought up, and the buyer said, "Charley, I would like to get it of you, but I don't see how we can. If you give us the goods at the right price you will get the order. I can't tell you what we're paying, but I will tell you when you quote the right price." The dealer went back to his store and wrote the jobbers for quantity prices. When this information came he took it to the buyer. "Nothing doing. Too high," was the verdict. Nothing daunted, the dealer wrote again, this time to the mills in Rhode Island, for samples and bale rates. Their reply was ½ cent per pound under the jobbers', so gleefully he set out for the mill. He was told he was too high, and because of the friendship the buyer compassionately told the dealer that they were buying direct from a mill in carload lots, having even put up an isolated building into which to store the highly inflammable stuff. Now, who on earth could compete with that soul stirring, nerve racking gait? And yet a few years before that Hardwareman had contributed money to a fund that the local Board of Trade had collected with which to buy a site to give it to that very mill as an inducement to have them locate in that city!

A "Tough" Experience

There is a Hardwareman not far from New York City who has unusually sane ideas in stock handling. This is one of his mottoes:

Get Rid of All Old Stock

and the motto is well worth a place on the brain tablet of every Hardwareman. This gentleman estimates what it costs him to maintain every square inch of floor and shelf space. Said he one day:

"There are items enough that a Hardware store has to have on hand, year in and year out, but unless it's a staple you don't catch me paying good money for storage on it. That's just what it is, storage. I pay rent for this place, so every square inch has a value. Why should I clutter up any part of a shelf with an unsold novelty! No, sir-ee. I weed out every month, and put the stuff on a sort of rummage table and hang a card outside to tell people of it. By night the table is empty, or nearly so, and what's left goes on next month's table."

Getting Rid of Old Stock

Here he looked slyly around, and added: "And, too, I put in a broken box of screws, some assorted butts, gate hooks, kitchen knives and forks, and other things right from stock. Ordinarily they would sell for, say, 5 or 6 cents. But the rummage table price is 10 cents per article. That pays storage charges on some of the old stuff, while I get my money out of them, and have good, clean, live shelves."

There's a man who need't fear the sheriff.

OHIO SHOVEL & STAMPING COMPANY.

THE OHIO SHOVEL & STAMPING COMPANY, successor to the Toledo Stamping Company, is now located in its new plant at Canal Dover, Ohio. It is stated that neither expense nor effort has been spared to make the plant especially modern and complete. Many new machines and labor saving devices, in addition to those formerly owned by the Toledo Company, have been installed, which will enable the new corporation to furnish a high standard of goods and prompt shipment. The officers of the company, which manufactures Shovels, Scoops, Spades and Sheet Steel Stampings, are O. C. Eben, president and general manager; D. Defenbacher, vice-president, and Albert M. May, secretary-treasurer.

The Prinslow-Watson Implement Company, Fond du Lac, Wis., has been incorporated with a capital stock of $15,000. The incorporators are F. O. Prinslow and J. B. Watson.

NECESSARY EXPENSES OF A SALESMAN.

BY FRED. BRADFORD ELLSWORTH.

THERE are some firms whose knowledge of handling a salesman is so vague and lacking in good sound business judgment that it is beyond my comprehension how they can possibly be successful at all. The only plausible excuse to offer is that these people have unfortunately never had experience selling goods on the road and do not understand the life of a salesman.

For the benefit of such who are unable to bring within the range of their vision the necessary expenses of a salesman I shall attempt to enumerate them and also make suggestions that will be of benefit.

Railroad Fares.

The first item of expense is railroad fare. The majority of firms allow their salesman full fare. If the salesman invests in mileage books, and many have half a dozen or more, necessitating an outlay of several hundred dollars of their own money, they reap the benefit of rebates. On the other hand, many firms emphasize the fact that mileage books are to be purchased and used whenever possible from an economical standpoint and all rebates returned to the company. In the course of a year these rebates amount to considerable money.

Where a salesman covers the entire country, or starts from the East and travels through to the Pacific Coast, it is impossible to use mileage books economically. Round trip tickets can be procured, good for several months, for much less money.

Hotels.

Hotels throughout the country differ but slightly in rates, for almost every city of any importance has within the last few years built new hotels, and one is about as good as another.

Good, comfortable rooms in any modern up to date hotel cost from $2 per day up, and with bath from 50 cents to $1 extra, irrespective of sample rooms, which of course cost more, depending on size. With few exceptions, hotels are run on the European plan, and meals will average $1 apiece. Breakfast and luncheon may not always cost $1 each, but no dinner at night can be had for that price, and $3 per day for a man with a normal appetite is indeed economical living. Occasionally accommodations can be procured for less money than here cited. At the same time there are some cities where these figures are inadequate.

Entertaining.

The treatment of customers is a question I have often heard discussed by employers and salesmen. The average salesman who is well known in his territory when he starts out in the morning generally fills his pockets with good cigars. Most everybody smokes nowadays and talking business while the fragrant aroma of a choice Havana permeates the atmosphere at times causes a feeling of good fellowship and often from a business standpoint has a beneficial effect.

The unredeeming part of it is shown more often than not by the new and inexperienced salesman, who gives away cigars indiscriminately, with the impression that it will help to ingratiate himself into the good graces of those with whom he comes in contact. Frequently it has a detrimental effect, and does not give a good impression at all.

It is customary for a salesman to invite a buyer to lunch with him occasionally, provided he knows him well enough, or to dine with him at night and spend the evening at the theater, or in amusement that is congenial to his guest. A salesman should never do this because he anticipates an order, but because when he enjoys the patronage of a house he is, as a rule, on friendly terms with the buyer. This is a pleasant and courteous manner of showing his appreciation of their pleasant business relations.

Incidental Expenses.

Bus and baggage, laundry, pressing clothes, telegrams, postage, typewriting and car fare are other incidental expenses. They are apparently of minor importance, still they amount to considerable money in a short time and are all necessities to a salesman.

Tipping Practice.

The next item of expense, and an increasing one, is that of tipping. This practice originated in Europe, became the vogue in this country, and then practically an unwritten law. It is now carried to such an extent that it is a disgrace to those who allow it. Railroads, hotels and cafés expect patrons to pay their employees' wages. For a salesman above all others to ignore this practice would result in his being subjected to such annoyance, discomfort, insult and humiliation that he simply could not endure it.

Expense Books.

Compelling a salesman to keep an itemized expense account is a question that has been discussed over hundreds of times by employers and salesmen. Its advisability or inadvisability is, I think, a matter of opinion. There are many firms who do not believe in asking their men to render an itemized account. They are furnished so much money when they start on a trip and the difference between that and what they return is their expense. Any man who pretends to know anything about business should know pretty nearly what it costs to travel on the road. The majority have had that experience. If they have not and employ salesmen, it would be an economy in the end to hire an experienced manager.

Red Tape.

I know of a firm recently who lost one of the best salesmen in the country, all on account of an expense book and red tape. The man was a high priced salesman whose services they had solicited. He agreed to cover a certain territory, and if to his liking was to sign a three-year contract. When he was ready to start the cashier handed him an expense book, with every conceivable item of expense enumerated, with instructions that at the end of each week upon receipt of his book a check for the next week's expenses would be forthcoming. Then they handed him a form sheet upon which he was to give the name of each person called on daily, and if he did not sell why not, and a lot of other unnecessary red tape.

The salesman was nonplussed and at the same time insulted, and going to the head of the house said: "Gentlemen, you hired me to sell goods. That is my profession and I have been doing it successfully for ten years. I am not a bookkeeper or accountant, or I should have applied for that position. If you have no confidence in my integrity why did you seek my services? I shall be pleased to look after your interests to the best of my ability, communicating such information as is of importance, but as for rendering an itemized expense account and a report such as your cashier insists upon I shall never do it." The firm was obdurate, and the next day the man signed a contract with another concern at $5000 a year, with the privilege of extending the contract to five years and an increase of salary.

Expense Account Advisable.

Personally speaking, I am in favor of a salesman keeping an expense account, and I think from a business standpoint it is for the best interests of a firm. I do not say this to cast any reflection on the honesty of a salesman. Most of them are honest and reliable. There may be some who are honest perhaps through caution and perhaps because well paid. Occasionally there are salesmen whose eyesight is so poor that they are unable to discriminate between their own money and that of the firm's. This class is invariably poorly paid and have to make both ends meet some way or other.

An expense book is a good reference for a firm to have. It shows just what the cost is of covering different territories. It is also handy in making out a route list and shows pretty nearly the time taken to cover it. It also shows the money spent on the trade, which at times according to conditions it may be expedient to increase or economize, all depending on the nature of the business.

R. E. DIETZ COMPANY.

THE R. E. DIETZ COMPANY, New York and Syracuse, N. Y., has recently built and occupied a fine new factory building in Syracuse, adjoining the smaller group of buildings which its business had greatly outgrown. This branch plant, known as factory No. 2, is a large rectangular structure of five stories, including basement, containing an aggregate of 100,000 square feet of manufacturing floor space. The building is equipped with the most modern and improved machinery and tools for making the extensive and comprehensive line of Lanterns, tubular and other styles, peculiar to the company.

This industry (which is probably the oldest and largest in this or other countries making Lanterns exclusively) was established in 1840 by Robert E. Dietz, in New York, where what is known officially as factory No. 1 has long been established at the corner of Greenwich and Laight streets. Robert E. Dietz, who died in 1897, was the father of Fred. Dietz and John E. Dietz, respectively president and treasurer and vice-president, who are the present owners and managers of the business, they having been brought up in it from youth. In 1887 the company was incorporated under the present title.

In 1898 the business of the Steam Gauge & Lantern Company, Syracuse, N. Y., manufacturing a similar line, was bought out and operated in conjunction with the New York plant. The combined production includes a large and comprehensive variety of Lanterns, from the smallest to large out of door and street Lamps or Lanterns, together with Railroad Lanterns of various kinds, of tinned and japanned steel, polished brass and nickeled brass, with plain and colored globes, with and without lenses.

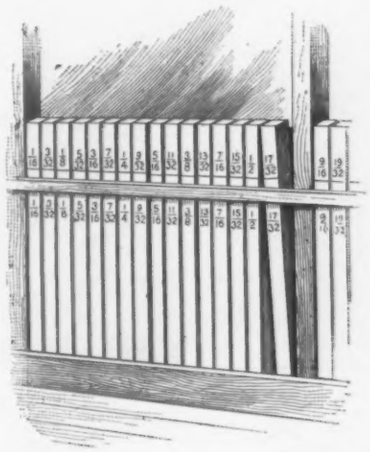
About a quarter of the combined product is exported. Comparatively little business is received from continental Europe, China and Japan, no serious attempt as yet having been made to get trade in a large way on the continent of Europe in competition with the native product. Many orders, however, are taken in Great Britain through the medium of the London office, and there is a large business in Automobile Lamps in the Parisian market, a line that severely taxes the producing capacity of both factories. The company claims the distinction of being the first to manufacture Automobile Lamps in large quantities in the United States.

As the innumerable processes necessary to the making of the Dietz Tubular and other Lanterns are similar in both cities a reference, necessarily condensed, describing the methods followed in New York may be of interest. Much of the initiatory work is begun on the seventh floor, where parts are punched and stamped out in dies made on the premises with other tools in its own machine shop. After blanking out from the flat sheets of metal the parts are trued up and formed in other dies, founts of all kinds blanked out and shaped and the company's name stamped in the bottom. Here also the large quantity of globe guards and springs required are quickly and accurately formed in ingenious automatic machinery specially designed for the particular part to which it is confined. Practically all the wire work needed is made direct from the coil by cleverly constructed automatic machinery. On the eighth floor are assembled the various parts and lathe spinning, buffing and polishing is done. Parts formerly cast are now more uniformly and better made from wrought sheet metal. The ninth floor is principally used for packing large lamps in original cases, a portion of it being reserved to assemble Street Lamps, Square and Side Lamps, and various styles and sizes of Automobile Searchlights. The painting, japanning and baking of japanned parts for large out of door Lamps occupies a portion of this floor also.

The sixth floor is devoted to assembling the more moderately priced Tin Lanterns, soldering and cleaning. Parts that have been through several die operations are dipped in hot tallow, so that the tin reflows and produces in effect a newly tinned article. Here, too, all iron parts are tinned, nickeling being done at the new Syracuse factory. Oil founts are thoroughly tested by gripping them with a pair of tongs, on one jaw of which is fastened a rubber stopper, which automatically seals the burner opening when by plunging the vessel into boiling water the smallest leak, if it exists, becomes at once apparent by the rising of telltale air bubbles, owing to the heating and resulting expansion of air in the fount. Tin dipped articles are held by workmen in open revolving sawdust or tumbling barrels and then polished. The fifth floor is utilized for fitting and assembling Tin Lanterns and storage of box shooks, bought in carloads, from which the packing cases are made in the building. Here likewise are assembled and packed the Brass Automobile Lamps. The fourth and third floors contain manufactured stock awaiting shipment. The second floor includes, in addition to the office and counting room, sample and sales room, from which the remaining space is partitioned off for a shipping department and general storeroom.

A RETAILER'S METHOD OF ACCOMMODATING DRILL RODS.

PHILIP WEIGEL, JR., a Hardware merchant of New Brunswick, N. J., whose excellent ideas and methods are well known in the metropolitan district, has an excellent scheme for accommodating Drill Rods. He has made a set of canvas covered boxes, one for each size he carries. They are about 37 inches long, nearly all Rods coming in 3-foot lengths, and 1½ inches square, with a cover perhaps 8 inches long fitting over one end. The size which each box contains is marked on the cover, as



Rack Supporting Canvas Boxes (37 x 1½ x 1½ Inches) Accommodating Drill Rods.

well as on the box itself, as indicated in the accompanying illustration, to prevent their becoming separated. The feature of the idea is the way the boxes are kept, occupying a minimum amount of space as they stand vertically against an unused section of wall, projecting of course only the width of the boxes, about 1½ inches. Other advantages of the plan are the accessibility of the stock and the readiness with which desired sizes may be selected. To hold the boxes in place a skeleton rack is formed, as shown in the cut, by nailing light strips of wood across in front of them, one strip at the bottom and one about a couple of feet above.

M. R. McCAUSLAND was elected president of the Norwalk Lock Company of South Norwalk, Conn., June 13. He has moved his family to South Norwalk and will make headquarters there, but will still supervise the business of the branch house in New York, of which he was chosen manager March 18 last, spending several days of each week in New York. Mr. McCausland, who was made general sales manager of the company April 1, has had a long and thorough training in the field of fine Builders' Hardware, in which most of his business life has been spent. Improvements are under way at the factory, including the installation of new machinery with a view to increasing the company's productive capacity.

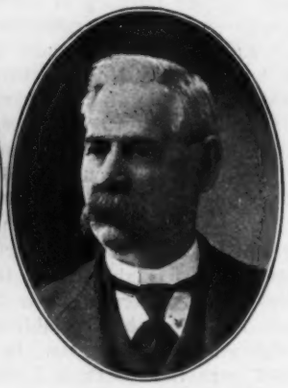
RETAIL HARDWARE ASSOCIATIONS.

IN connection with the reports of the annual conventions of State Hardware Associations which have appeared in our columns during the past four or five months portraits were given of many of the new officers chosen to direct the affairs of the organizations during the ensuing year, as well as of those who contributed to the entertainment and instruction of the meetings by reading practical papers on trade topics. In some cases, however, due to delay in obtaining the photographs, we were obliged at the time to omit certain of the officers and those who took an active part in the meetings, who by reason of their prominence in the work of their associations and their position as enterprising and successful merchants are entitled to a place in the gallery of notables identified with the retail Hardware Association movement. We accordingly have pleasure in presenting the accompanying galaxy of Hardwaremen connected with a number of different State Associations, as follows: John A. Manson, Burlington, Vt., director New England Retail Hardware Association; H. T. Moore, Alma, Neb., first vice-president, Nebraska Retail Hardware Association; C. L. Kelly, North Bend, Neb., second vice-president, Nebraska Association; J. H. McGrath, Hastings, Neb., Executive Committee, Nebraska Association; Daniel Kavanaugh, Fairbury, Neb., Executive Committee, Nebraska Association; Walter Gaebler, Winside, Nebraska Association; A. G. Hunt, Campbell, Nebraska Association; A. L. McDonald, Eagle, Nebraska Association; Geo. Haw, Jr., Ottumwa, Iowa, director, Iowa Retail Hardware Association; W. M. Orcutt, Sioux City, Iowa Association.

JOHN A. MANSON,
Director New England Association.

W. M. ORCUTT,
Iowa Association.

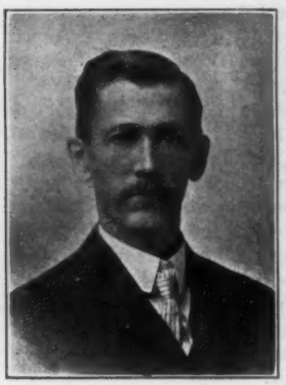
J. H. McRATH,
Executive Committee, Nebraska Association.



A. L. McDONALD,
Nebraska Association.

H. T. MOORE,
First Vice-President Nebraska Association.

C. L. KELLY,
Second Vice-President Nebraska Association.



A. G. HUNT,
Nebraska Association.

GEORGE HAW, JR.,
Director Iowa Association.

DANIEL KAVANAUGH,
Executive Committee, Nebraska Association.

WALTER GAEBLER,
Nebraska Association.

THE OKLAHOMA CITY CONVENTION.

THE OKLAHOMA CITY HARDWARE AND MANUFACTURERS' CLUB held a business and social meeting at the Indiahoma Club, Oklahoma City, Okla., Tuesday evening, June 12. The most important matter considered at the meeting was the question of giving a smoker and vaudeville entertainment for the Retail Hardware and Implement Dealers of Oklahoma and Indian Territory during their convention in Oklahoma City, July 10 to 12. The programme, as decided upon at the meeting, contemplates a banquet at the Indiahoma Club on the night of July 11. There will be a few five-minute talks and vaudeville numbers will be interspersed. The convention in question is assuming large proportions, as compared with previous gatherings. The secretary of the organization has secured a large building for exhibition purposes and is in correspondence with a large number of manufacturers who will have their goods displayed. No charge is being made for exhibition space.

J. W. Dry has purchased the business of J. S. Barr, in Clarence, Mo., and will carry a retail stock of shelf and heavy Hardware, Stoves, Tinware, Agricultural Implements and Paints and Oils.

NEW ENGLAND IRON AND HARDWARE ASSOCIATION.

THE annual meeting of the New England Iron and Hardware Association was held at Young's Hotel, Boston, Tuesday evening, June 19. The Board of Directors, as suggested by the Nominating Committee, was unanimously elected as follows: E. A. Loomis, A. C. Harvey,

R. M. BOUTWELL.

E. E. Farnham, A. B. Marble, Chas. F. Bragg, William Chamberlain, Allan J. Chase, R. M. Boutwell, O. A. Shepard, John T. Boyd, and Chas. W. Sabin. The directors elected officers for 1906-1907, as follows: Roswell M. Boutwell, president; Edward A. Loomis, vice-president; Charles H. Breck, treasurer; John T. Boyd, clerk. George J. Mulhall continues as manager. The reports of

E. A. LOOMIS.

committees showed that the association is in prosperous condition.

The new president, Roswell M. Boutwell, is treasurer of the Portland Iron & Steel Company operating large rolling mills at Portland, Maine, and also treasurer of Standard Horse Shoe Company, Wareham, Mass., being associated with his brother, Roland H. Boutwell, in these enterprises. Mr. Boutwell is also a member of the firm of Boutwell & Co., Boston, iron and steel merchants. Edward A. Loomis, vice-president, is a well-known Hardware merchant of Providence, R. I., being a member of the Belcher & Loomis Hardware Company.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM LOUIS EPSTEIN, 3193 Mission street, San Francisco, Cal., who carries a line of Mechanics' Tools and Hardware. Mr. Epstein's former store, at 538 Mission street, was destroyed in the recent conflagration.

FROM LALLY COMPANY, First and Folsom streets, San Francisco, Cal., which has been incorporated and will do a general jobbing business in Pipe and Fittings, Plumbers' Supplies, &c. Mr. Lally was formerly for a period of 13 years manager of the Crane Company's branch at San Francisco, and for the past year and a half has been representing the Mark Mfg. Company of Chicago and Zanesville, Ohio, and several other Eastern concerns.

FROM SMITH HARDWARE COMPANY, Ensley, Ala., which has bought the stock of Enameled Ware, Crockery, &c., of A. C. Tice.

FROM L. W. HENNEBERGER COMPANY, Paducah, Ky., which has purchased the retail interests of the Scott Hardware Company of that city. The new company has been incorporated with a paid-up capital of $10,000 and the following officers: T. J. Atkins, president; L. W. Henneberger, secretary and treasurer.

MISCELLANEOUS NOTES.

Samson Steel Sash Locks.

Builders' Supply Corporation, Indianapolis, Ind., is putting on the market a line of Samson steel sash locks. These are finished in amber bronze, copper bronze, electro bronze plated, antique copper, dull brass, sand blast and dead black. The locks are packed, with screws, one dozen in a box.

Solidhed Thumb Tacks.

The Hawkes-Jackson Company, 82 Duane street, New York, manufacturing a varied line of Solidhed thumb tacks, has just put out a new style counter display case, holding a gross of small, turned round wood boxes, containing 12 each Solidhed silvered steel thumb tacks, which can be retailed profitably at 5 cents each. The display case is so made that the greater portion of each perpendicular row of boxes can be seen by a prospective buyer, but cannot be removed without lifting the cover. There are three rows each on two sides and one row on each of the remaining two sides, a reserve supply of 4 dozen being contained inside. The case is made of stiff paper board covered with dark green paper and is 12 inches high, 6 inches wide and 3 inches deep.

Holly Pattern Coffee Spoon.

E. H. H. Smith Silver Company, Bridgeport, Conn., has added the coffee spoon shown herewith to its line of Holly pattern goods. It is designed to meet the demand for a floral pattern and is alluded to as being

Holly Pattern Coffee Spoon.

just enough conventionalized to prevent its being impractically unique. The die work, front and back alike, is referred to as of the best and as bringing out in every detail the beauty of the design. It is remarked that the finish further adds to its attractiveness and recommends it to those desiring artistic table ware. It is made in all the usual pieces.

The Victor Folding Miter Box.

The miter box shown in the illustrations contains a number of new features, important among which is that it may be folded flat, which, coupled with its light weight and small size, renders it easy to carry in the carpenter's kit box or packed in his chest. The miter box has a wide range of work. Any length or width of either a back saw

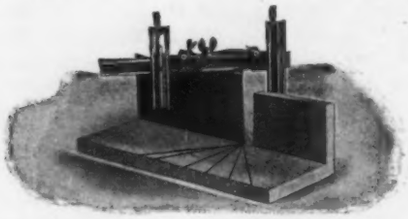


Fig. 1.—The Victor Folding Miter Box.

or panel saw can be used, and there can be cut with the box single, double or triple angles at one setting and at one operation. With a 26-inch saw a board 20 inches wide, a square, or a 17-inch wide miter can be cut. When in use the miter box is attached by means of four screws to a bench or beam, or mounted over a vise. The wooden part of the device is built by the carpenter and is screwed to the bench. In Fig. 2 the miter box is represented as folded. Among its various cuts are moldings of all kinds, shelf and finish boards of any width, com-

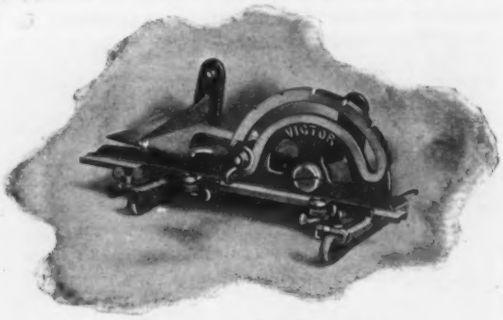


Fig. 2.—Victor Miter Box Folded.

pound angles on jack rafters, double and triple angles on stair balusters, as in Fig. 3; stair raisers, eave troughs and dovetails, as shown in Fig. 4. In framing it is used when attached to a beam in a manner that admits of dropping long rafters down through the floor timbers until the end to be worked is in the position to be sawed. The arm carrying the saw is above the work, and consequently there is nothing with which the teeth can come in contact excepting the work. The graduated index is also above the work, making it easy of adjustment for any of the regular miters or intersection cuts. For quick

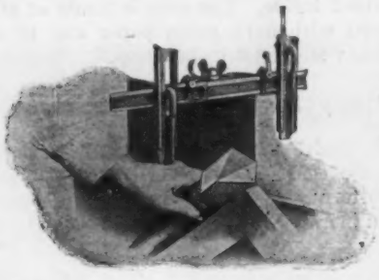


Fig. 3.—Double and Triple Angles Cut by Victor Miter Box.

adjustment to common miters a latch is provided which springs into the required notch in the graduated index plate, shown in Fig. 2, and a thumb screw riding in the slot of the index plate permits of adjustment to any angle between the regular miters, regulation miters being provided for by the latch notches. The saw guides can be raised to suit the hight of the work, and by placing the saw guides at different hights and using an auxiliary guide on the bench a triple angle may be cut. A triple angle, it is pointed out, is a rare requirement and indicates the wide range of the implement. In addition to the saw guides being adjustable vertically for cutting to any established depth they are also adjustable horizontally for the different lengths of saws. The miter box

Fig. 4.—Dovetail Cut with Victor Miter Box.

is being put on the market by J. C. McCarty & Co., 10 Warren street, New York.

Prisco Bread Mixer.

The Pritchard-Strong Company, Rochester, N. Y., is manufacturing the Prisco bread mixer, shown in the accompanying illustrations. The pail is an extra heavy one, highly burnished, and has a solid base. The clamp

Fig. 1.—Fastening Pail of Prisco Bread Mixer to Table with Flat Tongue Clamp.

for fastening the pail to the table is referred to as not letting go until released and as not boring holes on the under side of the table. Full directions for using the mixer are stamped in the pail cover. The heavy coated stirring rod is alluded to as mixing dough thoroughly and as mixing and kneading bread in two and one-half minutes better than can be done by hand in 20 or 30 minutes. No separate bread mixer is necessary, as the dough is

Fig. 2.—Putting Cover on Prisco Bread Mixer.

left to rise in the pail. The mixer makes doughnuts or anything raised with yeast as well as bread. The mixers are made in four and eight loaf sizes; half the quantity, however, can be made in either size. The mixers are packed one-quarter dozen to a case.

Automatic Lift and Drop Head Sewing Machine No. 24.

Demorest Mfg. Company, Williamsport, Pa., has recently put on the market the automatic lift and drop head sewing machine shown in the accompanying cuts. The wood work is of selected quarter sawed oak, and it is supplied with the company's ball bearing stand device.

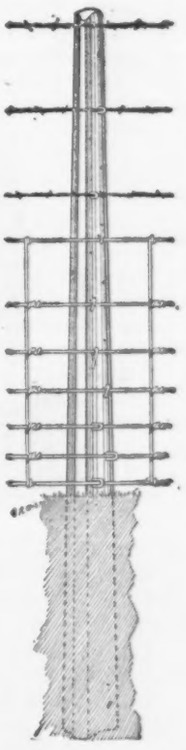
Fig. 1.—Automatic Lift and Drop Head Sewing Machine No. 24.

The front is full swell and the apron is raised automatically when the head is raised, thus giving room for the knees of the operator. The lower drawers are full swell, while the top drawers are convex. The drawer frames, into which the drawers slide, are closed at the ends and sides, so that they are practically solid, and the drawers are large and roomy. The head raises and lowers automatically with the raising and lowering of the leaf. The device that raises the head is a 1½-inch steel rod, with toggle joints. To prevent any possibility of the head sagging when in its proper position an automatic catch locks the head and holds it rigid. The drawer pulls, hinges and lifting rod, &c., are of gun metal finish. The company makes another machine, No. 84, with practically the same working parts, but with less elaborate wood work, which is offered at a lower price than the one illustrated.

Fig. 2.—Automatic Lift and Drop Head Sewing Machine No. 24, Showing Machine Partly Raised.

Pyramid Fence Post.

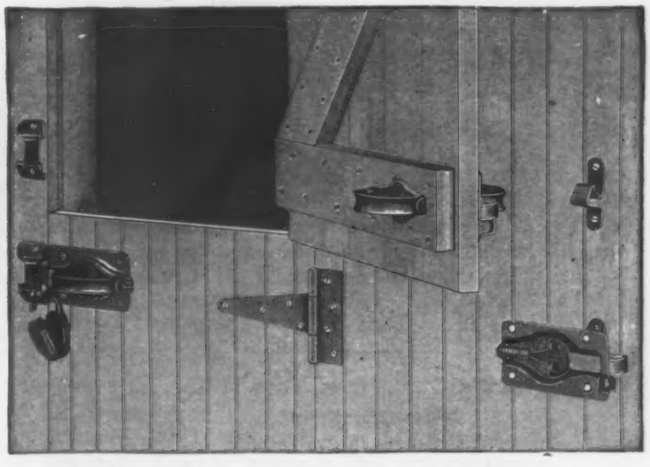
The Pyramid Post & Pole Company, Cedar Rapids, Iowa, is manufacturing a fence post, as shown in the accompanying illustration, which is recommended for all purposes where wood posts can be used. The posts are of steel and concrete construction and have a 4-inch triangle top and an 8-inch triangle base, with the corners rounded, and are of triform shape. The regulation posts are 6½ feet long and will take a 48-inch fence, permitting of 2½ feet being buried in the ground. Embedded in the concrete is a woven wire and steel post which is of sufficient strength to support a fence, but additional strength is given by the concrete, which also preserves the steel, inasmuch as no parts are exposed. In their manufacture steel tube molds are used that produce a smooth surface which will withstand the elements, and with the absence of corners a very neat appearance is procured. The staple fasteners are so arranged that they can be attached to any kind of woven wire or netting as well as barb wire, and are put on after the posts are made and can be taken off or replaced, as desired. The universal fasteners are pointed out as essential features of these posts, consisting of a series of small holes, piercing right and left flanges alternately, through which the staples are inserted and are struck a blow with the hammer to clinch them. The posts weigh about 55 pounds each. The line of posts embraces fence, gate, line, braces, hitching and lawn fence, and in the near future poles from 15 to 30 feet in length for rural telephone lines will be manufactured.



Pyramid Fence Post.

The Whitcomb Steel Barn Door Latch.

Albany Hardware Specialty Mfg. Company, Albany, Wis., is offering the steel barn door latch, shown herewith. The strength, durability and convenience of the latch are referred to. It is easily adjusted to a door of any thickness. It will not catch harness, and two large handles make it easy to hold the door or to open it from either side. It is made of steel to insure its being unbreakable. The latch is arranged for the use of a padlock. Two catches are furnished with each latch, so that the door or gate can be held open or closed. The point is made that as the door is caught and held either open or shut damage to the door by wind is prevented. The latch is japanned and the bolt tinned.



The Whitcomb Steel Barn Door Latch.

Bullock's Reversible Porch Swings.

Indiana Bent Rung Ladder Company, Indiana, Pa., has added to its line porch swings, two of which are reversible, as shown in the accompanying cuts. The reversible back of the swing, illustrated in Fig. 1, can be changed in five seconds, it is said. The swings can be

Fig. 1.—Bullock's Mission Style Reversible Porch Swing No. 2.

taken apart in a few minutes and knocked down for storage or shipment. This swing is made in lengths of from 3 to 6 feet. The slats of the swing, shown in Fig. 2, are all bolted to the frame, no rivets being used. The swing is 3 feet long between the arm rails. Both swings are made of thoroughly seasoned kiln dried oak, and the angles and flat parts are of the best low grade carbon steel. The swings are finished in golden, weathered or

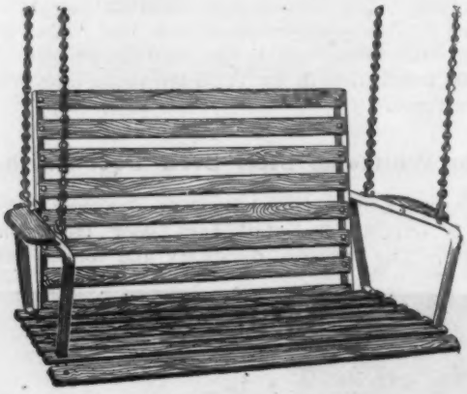


Fig. 2.—Bullock's Reversible Porch Swing.

green oak, hand rubbed, showing the various growths of the wood. The company also manufactures nonreversible swings. All swings are so constructed that they are shipped knocked down, in order to save freight and storage space. The swing shown in Fig 1 is packed in a crate 6 inches thick, and the one illustrated in Fig. 2 in a crate 3½ inches thick.

Riek's Christmas Tree Holder.

Rhinelander Mfg. Company, Rhinelander, Wis., is offering the Christmas tree holder shown in the accompanying illustrations. In Fig. 1 it is shown ready for use, and in Fig. 2 folded for shipping or storing. The standard is made of band iron, ⅛ inch thick and ¾ inch wide. The base measures 16 inches and is 10 inches in hight. As seen in Fig. 2, the base pieces have the same contour but are of slightly different size, so as to fold one within the other. There are holes in the pieces at the bottom through which screws are to be driven to securely hold the device to the floor of the room or whatever the holder may stand upon. The spur upon which the parts turn is also used to set the butt of the tree on, so that it will remain stationary at the bottom. The four terminals of the holder have threaded holes near their ends, to take the thumb or binding screws. The tree trunk is passed inside the ring and between the terminals and rests on the spur below. The thumb screws are turned so as to force their points into the trunk of the tree. The

Fig. 1.—Riek's Christmas Tree Holder.

holder is thus suitable for use on different size trees down to 3 inches in diameter, and by the adjustment of the screws the tree may be brought to a vertical position and held there without the use of wires or braces. The holder is finished in green enamel, is neat in appearance,

Fig. 2.—Riek's Holder Folded for Shipping or Storing.

convenient, occupies little space and, the manufacturer states, will last indefinitely. The holders are carefully put up in 1, 2 and 3 dozen packages, weighing 33 pounds to the dozen.

Motor Driven Emery Wheel Grinder.

Coates Clipper Mfg. Company, Worcester, Mass., has just put on the market the motor driven emery wheel grinder shown in the accompanying cut. It has a speed of 2500 revolutions per minute, giving the 1-inch emery wheel 21,000 revolutions per minute. The

Motor Driven Emery Wheel Grinder.

device can be used for grinding dies in drops and in presses; it can be attached to the tool post of a lathe for internal grinding and can be used for finishing up pattern work. With a buffing spindle in the same machine the device can be used for polishing and buffing brass. It can also be used for polishing brass signs and brass work on store fronts and for polishing brass work on automobiles. By taking out the buffing spindle and putting in a breast drill the device can be used for drilling.

Royal Blue Washing Machine.

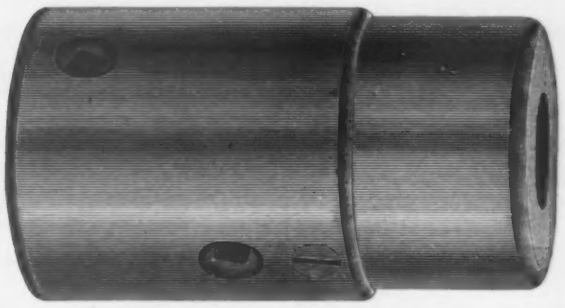
The H. F. Brammer Mfg. Company, Davenport, Iowa, is manufacturing the Royal Blue washing machine, shown herewith. The tub of the washer is made of selected

Royal Blue Washing Machine.

kiln dried Louisiana cypress. The legs are solid with the tub and well braced. The inside surface is corrugated similar to a washboard, thus affording considerable rubbing surface. The lid is made of two thicknesses of lumber, screwed together to prevent warping and to make it steam tight. The dasher block is made of hard wood and the dasher of iron, heavily galvanized. The gearing is made from gray iron and steel and will run forward or backward with ease, reversing automatically. The washer is finished in natural wood color, with the castings and hoops painted a royal blue enamel. The company states that it has been manufacturing washing machines for over 30 years and that in this machine is embodied all the improvements derived from its long experience.

The Wide Range Drill Chuck.

The Wide Range Drill Chuck & Tool Company, Muncie, Ind., is offering the drill chuck shown herewith. Among the points of excellence claimed by the manufacturer are the following: That it is a positive drive; that it will take and drive a straight shank, taper shank without tang, a combination of square and round, the Graham shank, a square shank or a taper square shank, without readjusting or changing the chuck in any way; that it is self centering and always true; that it is simple, having no complicated parts; that it is perfectly smooth at all times, whether the smallest drill or the largest tool is in use within its range; that, being small, it will drill holes close to a wall or angle; that it is neat in appearance and well made; that it is steel throughout and cannot be broken; that its grip need not be forced by the operator; that it will not damage the shank of tools and they may still be used in the old way, and that it places all untanged drills back in commission at any time, thus obviating the necessity of returning and retanging before use in a socket. The chuck is made in four sizes, to take the following drills: No. 0 takes No. 60 to 5-16 inch drill; No. 1 takes from 7-32 to ½ inch



The Wide Range Drill Chuck.

drill, and No. 1 taper to 19-32 inch; No. 2 takes from ⅜ to ¾ inch drill, and No. 1 or No. 2 taper to 29-32 inch; No. 3 takes from ½ to 1 inch drill, and No. 2 or No. 3 taper to 1¼ inch.

L. C. Hunt has retired from the Tomkins-Hunt Hardware Company, Telluride, Col., which has been succeeded by Tomkins-Cristy Hardware Company, F. E. Cristy, manager.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal
Linseed, City, raw	39 @40
City, Boiled	40 @41
State and Western, raw	37 @38
Raw Calcutta Seed	68 @..
Lard, Extra Prime, Winter	71 @72
Extra No. 1	54 @55
No. 1	42 @44
Cotton-seed, Crude, f.o.b. mills	26 @27
Summer Yellow, Prime	35 @..
Summer Yellow, off grades	35 @35¼
Sperm, Crude	55 @..
Natural Spring	@..
Bleached Spring	@..
Natural Winter	63 @65
Bleached Winter	66 @67
Bleached Winter, Extra	68 @69
Tallow, Prime	31 @33
Whale, Crude	32 @33
Natural Winter	42 @44
Bleached Winter	44 @46
Extra Bleached Winter	46 @50
Menhaden, Brown, Strained	26 @29
Light, Strained	27 @30
Bleached, Winter	@..
Extra Bleached, Winter	@..
Southern	@..
Cocoanut, Ceylon	₱ lb 7 @ 7¼
Cochin	₱ lb 8 @ 8¼
Cod, Domestic, Prime	30 @33
Newfoundland	35 @37
Red, Elaine	37 @40
Red, Saponified	₱ lb 4¾@ 5
Olive, Italian, bbls	57 @60
Neatsfoot, prime	48 @49
Palm, Logos	₱ lb 6 @ 6¼

Mineral Oils—

Black, 29 gravity, 25@30 cold test	₱ gal. 10½@11½
29 gravity, 15 cold test	11½@12½
Summer	10½@11½
Cylinder, light filtered	18 @19
Dark filtered	16 @17
Paraffine, 903-907 gravity	13½@14
908 gravity	12½@13
883 gravity	10¼@10¾
Red	12½@14

In small lots ¼¢ advance.

Miscellaneous—

Barytes:		
White, Foreign	₱ ton	$17.50@19.00
Amer. floated	₱ ton	19.00@.....
Off color, No. 2	₱ ton	13.50@15.00
Chalk, in bulk	₱ ton	3.00@ 3.25
In bbls	₱ 100 lb	....@ .35
China Clay, English	₱ ton	11.00@17.00
Cobalt, Oxide	₱ 100 lb	2.50@ 2.60
Whiting, Common	₱ 100 lb	.43@ .48
Gilders	₱ 100 lb	.50@ .55
Ex. Gilders	₱ 100 lb	.55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.59 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	60½@61
In machine bbls	61 @61½

Glue—

	₱ lb
Cabinet	14 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	41 @42½
Bone Dried	51 @52
Button	40 @50
Diamond I	54 @55
Fine Orange	48 @50
A. C. Garnet	44 @44½
D. C	57 @60
Octagon B	@52
T. N	47 @48
V. S. O	54 @55

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9½@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
In Barrels	@ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Lead, White, Dry, in bbls	@ 6¾
Zinc, American, dry	4¾@ 5
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¾
Paris, Red Seal, dry	9¾
Paris, Green Seal, dry	10½

Zinc, V. M. French, in Poppy Oil:

Green Seal:	
Lots of 1 ton and over	12¾@13¼
Lots of less than 1 ton	12¾@13¾

Zinc, V. M. French, in Poppy Oil:

Red Seal:	
Lots of 1 ton and over	11¾@11¾
Lots of less than 1 ton	11¾@12¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black Drop, American	4 @ 6
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.20
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
Litharge, American, bbls	@ 7¼
Ocher, American	₱ ton $8.50@16.00
American Golden	2½@ 3½
French	1¼@ 2½
Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 8½
American	3 @ 3¾
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Italian, Raw, Powdered	3 @ 6½
American, Raw	1½@ 2
American Burnt and Pow	1½@ 2
Talc, French	₱ ton $15.00@30.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
English	₱ 100 lb 80 @1.00
American	₱ 100 lb, No. 1, 75 @80
American	₱ 100 lb, No. 2, 60 @65
Umber, T'key, Bnt. & Pow	2½@ 3½
Turkey, Raw and Powdered	2½@ 3½
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome	12 @14
Vermilion, American Lead	10 @25
Quicksilver bulk	65 @..
Quicksilver, bags	@66
English, Import	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Dohmestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....℔ lb 9@9¼ ¢

Imported—

Peter Wright & Sons.....℔ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Pats., reg. finish.....50&10&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....60%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...5¼@5¾¢
No. 1½ Com., New Style 5¾@6¼¢
No. 2 Solid Collar.....6@6½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..1½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40@50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3¼¢

Towel—

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 1, Jap'd, $1.20; No. 1, Tin'd, $1.50; No. B, Jap'd, $2.00; No. 2, Tin'd, $2.25.
Lyon, Jap'd, per doz., No. 2, $1.25; No. 3, $1.50.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (R. M. Co.)..℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List..60&10@60&10&5%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells—Cow—

Ordinary goods.....70@70&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass..60&10%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼¢
Steel Alloy Church and School .....50&10@60%
American Tube & Stamping Co. Gongs 15%
Table Call Bells.....50@50&10%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son's 1906 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ x 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle $3.00 list May 21, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅝ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....50@50&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square ...66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10@—
Stove .....87½&10@—

Tire—

Norway Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Hay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*		*2½*	
Per doz.....	*$8.65*		*11.50*	

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each...25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American. $1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

	Quart.....	*10*	*12*	*14*
Water, Regular		*1.40*	*1.70*	*1.90*
Water, Heavy		*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom		*2.30*	*2.55*	*2.95*
Well		*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, list, Sept., '96.15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—

Discount.

Reversible and Broad	*75&5%*
Light Reversible, Light Narrow	*75&10%*
Loose Joint, Narrow, L'ht Inside Blind, etc.	*75%*
Back Flaps, Table, Chest.	*70&10%*

Extra, 10&10@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 5%; 1200, 33⅓%; 200, 300, 600, 900 .....40&10%
Hendryx Bronze: Series 700, 800.... 40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4@4¼¢
Sharp, 1 prong...per lb., 4¼@4¾¢
Burke's Blunt, 4@4¼¢; Sharp, 4½@4¾¢

Gautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B ..... 52@55¢
G. D ..... per M 34@35¢
F. L ..... per M 40@42¢
G. E ..... per M 48@50¢
Musket ..... per M 62@63¢

Primers—

Berdan Primers, $2 per M ... 20%
B. L. Caps (Sturtevant Shells) $2 per M ... 20%
All other primers per M. $1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ... 10&5%
38 C. F., $7.00 ... 10&5%
22 cal. Rim, $1.50 ... 10&5%
32 cal. Rim, $2.75 ... 10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball ... $1.49
Central Fire ... 25%
Target and Sporting Rifle ... 15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting ... 50%
Rim Fire, Military ... 15&5%

Casters—

Bed ... 70@70&10%
Plate ... 60&10@60&10&5%
Philadelphia ... 75@75&10%
Acme, Ball Bearing ... 33⅓%
Boss ... 70&10%
Boss Anti-Friction ... 70&10%
Gem (Roller Bearing) ... 80%
Martin's Patent (Phoenix) ... 45%
Standard Ball Bearing ... 45%
Tucker's Patent low list ... 30%
Yale (Double Wheel) low list ... 50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$3.70	5.90	4.95	4.20	4.05	3.95	3.90

⅝ to 1 inch.

¾	⅞ to 1	1⅛ to 1¼
$3.85	3.70	3.65	3.80

German Coil ... 60&10&10@70%

Halter—

Halter Chains ... 60&5@60&10%
German Pattern Halter Chains, list July 2½, '97 ... 60&10&10%
Covert Mfg. Co, Halter ... 35&5%
Covert's Saddlery Works Halter ... 70%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring ... $25.00
6½—6-2, Str'ght, with ring ... $26.00
6½—8-2, Str'ght, with ring ... $30.00
6½—10-2, Str'ght, with ring ... $35.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Eastern Standard Traces, Wagon Chain, &c ... 60&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ... 60&10%
Brass ... 60&10%
Safety Chain ... 70&10%
Gal. Pump Chain ... lb. 4@4½¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion ... 40%
Covert Sad. Works:
Breast, Hold Back, Rein ... 70%
Oneida Community:
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Dog Leads and Kennel Chains ... 45@60&5%
Wire Goods Co.:
Dog Chain ... 70&10%
Universal Dbl.-Jointed Chain ... 50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain, 60&5%; Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set .8¢
Aluminoy Sash Ribbon, per 100 ft. ... $1.25@3.00
Sash Ribbon Attachments, per set .8¢

Chalk—(From Jobbers.)

Carpenters' Blue ... gro., 40@—¢
Carpenters' Red ... gro., 35@—¢
Carpenters' White ... gro., 30@—¢
See also Crayons.

Checks, Door—

Bardsley's ... 45%
Pullman, per gro. ... $54.00
Russwin ... 40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools ... 55%
Youths' Chests, with Tools ... 40%
Gentlemen's Chests, with Tools .. 30%
Farmers', Carpenters', etc., Chests, with Tools ... 20%
Machinists' and Pipe Fitters' Chests, Empty ... 50%
Tool Cabinets ... 50%
C. E. Jennings & Co.'s Machinists' Tool Chests ... 33⅓&10%

Chisels—Socket Framing and Firmer

Standard List ... 75&10@75&10&5%
Buck Bros. ... 30%
Charles Buck ... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 ... 60%
Socket Framing No. 15 ... 60%
Ohio Tool Co.'s ... 70%
Swan's ... 75%
L. & I. J. White ... 30@20&5%
L. & I. J. White, Tanged ... 25&5%

Tanged—

Tanged Firmers ... 33 1-3@40%
Buck Bros. ... 30%
Charles Buck ... 30%
C. E. Jennings & Co. Nos. 191, 191.. 25%

Cold—

	lb.
Cold Chisels, good quality	13@15¢
Cold Chisels, fair quality	11@12¢
Cold Chisels, ordinary	9@10¢

Chucks—

Almond Drill Chucks ... 35%
Almond Turret Six-Tool Chuck ... 35%
Beach Pat., each $8.00 ... 35&5%
Empire ... 25%
Blacksmiths' ... 25%
Jacobs' Drill Chucks ... 35%
Pratt's Positive Drive ... 25%
Skinner Patent Chucks:
Independent Lathe Chucks ... 40&10%
Universal, Reversible Jaws ... 40%
Combination, Reversible Jaws ... 40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive ... 33⅓%
Planer Chucks ... 30%
Face Plate Jaws ... 40&10%
Standard Tool Co.:
Improved Drill Chuck ... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ... 35%
Scroll Combination, Nos. 82 and 84 ... 30%
Geared Scroll, Nos. 33, 34 and 35 .. 35%
Independent Iron, Nos. 18 and 318. 40%
Independent Steel, No. 64 ... 30%
Union Czar Drill, Nos. 000, 101, 103 ... 35%
Universal 11, 12, 16, 17, 13, 14, 15 .. 40%
Universal, No. 42 ... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ... 40%
Steel Face Plate Jaws, Nos. 70 and 72 ... 35%
Westcott Patent Chucks:
Lathe Chucks ... 50%
Little Giant Auxiliary Drill ... 50%
Little Giant Double Grip Drill .. 50%
Little Giant Drill, Improved ... 50%
Oneida Drill ... 50%
Scroll Combination Lathe ... 50%

Clamps—

Adjustable, Hammers' ... 20@20&5%
Carriage Makers', P., S. & W. Co. ... 40&10@50%
Besly, Parallel ... 33⅓&10%
Lineman's, Utica Drop Forge & Tool Co. ... 40%
Wood Workers, Hammers' ... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable ... 55%
Iwan's Champion, Stationary ... 45%

Sidewalk—

Star Socket, All Steel, ₱ doz. $4.05 net
Star Shank, All Steel, ₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. ... 30%
Fayette R. Plumb ... 30%
L. & I. J. White ... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
'98 Chicago Horse, each ... $8.75
1902 Chicago Horse, each ... 10.75
20th Century Horse, each .. 15.00
Lightning Belt Horse, each. 15.00
Chicago Belt Horse, each. 20.00
Stewart's Enclosed Gear Horse, each ... 8.75
Stewart's Patent Sheep Shearing Machine, each ... $12.75
} 33⅓

Clips, Axle—

Regular Styles, list July 1, '05. 80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks ... 70@70&10%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ... 40%
Leather, Walter B. Stevens & Son's list ... 40%

Combs, Curry—

Metal Stamping Co. ... 40%

Mane and Tail—

Covert's Saddlery Works ... 60&10%

Compasses, Dividers, &c.

Ordinary Goods ... 75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers ... 65%
Calipers, Double, 65%; Inside or Outside ... 65%
Calipers, Wing ... 40%
Compasses ... 50%
Wm. Schollhorn Co.:
Excelsior Dividers ... 60%
Lodi Dividers ... 75%

Conductor Pipe,—

L. C. L. to Dealers:

Territory:	*Galvanized*	
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	70&10%	60&7½%	40&10%
Central:			
	70&2½%	60%	40&7½%
Western and Southern:			
	65&10%	50&10&2½%	40&5%
	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
So. Western			
	62½&7½%	50&5%	40&2½%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal,	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined, 25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 23@24¢; lighter than 3 lbs. to pair ... 25@26¢

Cord—Sash—

Braided, Drab ... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 2½¢; No. 7, 2½@2½¢; No. 6, 2½@—¢.
Cable Laid Italian ... lb., *A, 18¢; B, 16¢*
Common India ... lb. 10@10½¢
Cotton Sash Cord, Tw'ted. 17@19¢
Patent Russia ... lb...@14¢
Cable Laid Russia ... lb...@15¢
India Hemp, Braided .. lb...@18¢
India Hemp, Twisted .. lb. 12@13¢
Patent India, Twisted .. lb. 12@13¢
Annistoa Cordage Co.: ₱ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ₱ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ₱ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10 ... ₱ lb 23 ¢
Peerless:
Cable Laid, Italian, 16¢; Russian, 14¢; India ... 12 ¢
Braided India ... 18 ¢
Pullman:
Wire Sash Cord ... 10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, per lb., Drab Cotton, 40¢; Italian Hemp, 40¢; Linen, 55¢; White Cotton or Spot ... 35 ¢
Massachusetts, White ... ₱ lb 30 ¢
Massachusetts, Drab ... ₱ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen ... 57½¢
See also Chain and Ribbon.

Wire, Picture—

List Oct., '00 ... 85&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10%

Cradles—

Grain ... 40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@7.50 at factory, but lower prices made by jobbers

D. M. Steward Mfg. Co.:

Genuine,	Per gro.
Round Pencil, $2.25; Square Pencil, $1.75; Flat Crayon, $2.50; Metal Workers' Crayon, $3.00; Rolling Mill Crayon, $3.00.	

} Case lots, 20%.

Compo.	Per gro.
Round Pencil, $1.50; Square Pencil, $1.50; Flat Crayon, $1.50; Metal Workers' Crayon, $2.50; Rolling Mill Crayon, $2.50; Railroad Crayon, $4.00; Compo. Crayon, $4.00.	

} Case lots, 50&20%.

Zelnicker's Lumber:
Red, Blue, Green ... ₱ gro. $6.50
Black ... ₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light ... $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ... ₱ doz. $3.00
Wm. Rogers & Son ... ₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co. ... 40%
Red Devil ... 50%
Smith & Hemenway Co. ... 50%
Woodward ... 40%

Meat and Food—

American ... 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%

No. 202, $1.50 ... 40&7½%
Dixon's ... ₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ... 40&10@50%
Little Giant ... ₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers ... 25%
New Triumph No. 605, ₱ doz. $24.00 ... 40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00 ... 45&10&10%
Woodruff's ... ₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shapers ... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c. ... 40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9 ... 55%
Kraut Cutters, 36 x 12, 40 x 12 ... 40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ... ₱ doz. $3.00
Combined Slaw Cutter and Corn Grater ... ₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters ... 40%
Slaw Cutters, 1 Knife .. ₱ gr. $18@$20
Slaw Cutters, 2 Knife .. ₱ gr. $22@$30

Tobacco—

All Iron, Cheap .. doz. $1.25@$1.50
Enterprise ... 25@30%
National, ₱ doz., No. 1, $21; No. 2, $18 ... 40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger .. per doz., $9.00
Iwan's Imp'ved Post Hole Auger. 40&5%
Vaughan Pattern Post Hole Augers, ₱ doz., $6.25
Perfection Post Hole Diggers, ₱ doz. ... $8.25
Split Handle Post Hole Diggers, ₱ doz. $7.25
Kohler's, ₱ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer ... $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00 ... 60%
Samson, ₱ doz. $34.00 ... 25%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $12; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers ... 35%
Diamond Wheel Dresser Cutters ... 35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each ... $1.50@$1.75
Breast, Millers Falls ... 15&10%
Breast, P., S. & W. ... 40%
Goodell Automatic Drills. 40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3 ... 16⅔%
Johnson's Drill Points ... 16⅔%
Millers Falls Automatic Drills. 33⅓&10%
Ratchet, Curtis & Curtis ... 25%
Ratchet, Parker's, 40%; Weston's .. 40%
Ratchet, Weston's, Style H Improved ... 40%
Ratchet, No. 912 ... 40%
Ratchet, Whitney's, P., S. & W. .. 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 19, $12.00 ... 33⅓%

Twist Drills—

Bit Stock ... 60&10&10@70%
Taper and Straight Shank ... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz. .45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2¼-in., $6; 4-in., $7.50; 6-in., ₱ ... 50%
Buck Bros.' Screw Driver Bits ... 30%
Champion ... 50%
Edson ... 60%
Fray's Hol. H'dle Sets, No. 3, $12 .. 50%
Gay's Double Action Ratchet ... 35%
Goodell's Auto .. 50&10&10@50&10&10&5%
Hurwood ... 40%
Mayhew's Black Handle ... 40%
Mayhew's Monarch ... 40&10%
Millers Falls, Nos. 20 and 21 ... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 .. 15&10%
New England Specialty Co. ... 50&10%
Smith & Hemenway Co. ... 40&5%
H. D. Smith & Co.'s Perfect H'dle. 40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles, 65%; No. 86, 75%; Victor, 55%; Defiance .. 70%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	80&2½%	70&7½%	40&10%
Central:			
	75&10&7½%	70%	40&7½%
Western and Southern:			
	70&20&7½%	60&15&2½%	40&5%
So. Western:			
	70&20%	65&2½%	40&2½%

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I.
Gauge ... 60&10%
No. 26 ... 50%

No. 24.....25%
No. 22.....40%
Copper.....50%

Elbows, Stove Pipe—
Dover, one piece.....40%
Perfect Elbows (R. M. Co.).....40%

Emery, Turkish—
¼ to ⅜ 5½ to 220 Flour.
Kegs.....lb. 5 ¢ 5½¢ 5½¢
½ Kegs.....lb. 5½¢ 5¾¢ 5¾¢
¼ Kegs.....lb. 5½¢ 6 ¢ 6 ¢
10-lb. cans, 10 in case....6½¢ 7 ¢ 6 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%
Walling's.....40&10%

Cord and Weight—
Ives.....40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 2½, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.25*	*3.75*	*4.25*	*4.75*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 50&10&10%; Light.....60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....66⅔%
Champion, Hay.....66⅔%
Champion, Header.....66⅔%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp.....$2.75 } 10&2½%
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15

Gates, Molasses and Oil—
Stebbins' Pattern.....80&10%

Gauges—
Marking, Mortise, &c..50&10@60%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@6.00
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 25
Pike Mower and Tool Grinder, each.....$6.00 } 25

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web.....45%
Jute Rope.....45%
Sisal Rope.....33½%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and R. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 50¢....80&10%
Over 5 lb., per lb., 30¢..80&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—
Atkins'.....40%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@$3.00
Brad Awl.....gro. $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80¢85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle.....℔ gro. $0.85@$1.50

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, ℔ doz., No. 1, $8.00; No. 2.....$8.60
Allith No. 3, ℔ doz.....$21.00
Allith Adjustable No. 4, ℔ doz.$30.00
Reliable Parlor Door, ℔ set....$2.50
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered.....60&2%
Special.....70&5%
Lawrence Bros.:
Advance and Sterling.....60&10%
Cleveland and Peerless.....75%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.....60%
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247.....60&5%
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10,50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Roller B'r'g, Nos. 39, 41, 43.....70&10%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.10; No. 121, $2.25; No. 150.....$2.35
Safety Underwriters F. D. No. 101.....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132.....50&10%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 29.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2..70&10%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60&10%
Hinged Tandem No. 46....60&5%
Folding Door B. B. Swivel No. 135.....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas, 60%; Freight Car Door.60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic, 60%; Rex Hinge Door.60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door, 50&10%; Railroad, 50&10%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle.....70%
Climax Anti-Friction.....50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $8.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro.....$15.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 85.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5.....75&10&5%
Buffalo Gravity Lockin' Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ....@$2.00
Without Latch...doz. ....@$1.60
Reversible Self-Closing:
With Latch.....doz. ....@$1.75
Without Latch...doz. ....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

	Nos. 1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback, Cast Iron...$6.50@$7.00
Non-Holdback, Cast Iron$6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....60%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdbk, ℔ gro. pr. $9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...65%
Heavy Strap Hinges..75%
Light T Hinges.....60%
Heavy T Hinges.....55%
Extra H'y T Hinges..70%
Hinge Hasps.....45%
Cor. Heavy Strap....75%
Cor. Ex. Heavy T..70&10%

Extra, 10&5&10%

Extra 5@10% often given.

Screw Hook and Strap. { *6 to 12 in.* ..lb. 3¾¢ ; *1¼ to 20 in.* ..lb. 3½¢ ; *22 to 36 in.* ..lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch.....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
Per doz.

Inch	*15*	*16*	*17*	*18*
Galv. Open	$2.50	2.75	3.00	3.25
Jap. Open	$1.90	2.10	2.25	2.35
Galv. Funnel	$3.00	3.30	3.60	3.90
Jap. Funnel	$2.45	2.65	2.85	3.50

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 66⅔%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe..₱ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B. 6½ in.....$3.35
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'ning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₱ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....*80&10@..%*
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see *Stops, Bench. Bush, Light, doz. $1.75; Medium, $5.35; Heavy, $6.25*
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz......*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&5@60&10&5%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 4 to 10.....*lb. 3 @3¼¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	65	62	75	72
Tin'd Tops	70	67	80	77

New England Pressing..*lb. 3¾@4¢*

Pinking—
Pinking Irons.....*doz. 60¢*

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Covert's Saddlery Works:
Daisy.....60&10%; Victor, 60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....35%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46...60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Mincing—
Buffalo.....₱ gro. $13.00

Miscellaneous—
Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.50*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz. $4.25@4.50
Lift Tubular, No. 0.....
doz. $4.75@5.00
Hinge Tubular, No. 0.....
doz. $4.75@5.00
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ₱ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 123.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—
Wire Clothes, Nos. 18 19 20
100 feet.....$2.25 2.00 1.75
75 feet.....*$1.75 1.55 1.10*
Anniston Waterproof Clothes, 50 ft., ₱ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.80; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron....*75&10&5@80&5%*
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 62½%; Crescent, 50&10%; Iron, 62½%; Window Ventilating, 60%; Robinson Pat. Ventilating Sash Lock, 40%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power.....
₱ doz. $18.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$54.00
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$30.00

Mallets—
Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list..50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria..50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list..70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M, S, C, K, T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list..50%

Nails—
Wire Nails and Brads, Miscellaneous.....*85&10@85&10&5%*
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	*0*	*7*	*8*	*9*	*10*	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%

Western.....₱ lb 8½¢
Jobbers' Special Brands.....
per lb. 9@10¢

Picture—

	1½	*2*	*2¼*	*3*	*in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*..gro*
Por. Head	*1.10*	*1.10*	*1.10*		*..gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: Off list.
Square, Blank or Tapped..
4.90@5.00¢
Hexagon, Blank or Tapped..
5.30@5.40¢
Square, Blank, C. & T.5.20@5.30¢
Hexagon, Blank, C. & T..
5.90@6.00¢
Hot Pressed:
Square, Blank.....*5.10@5.20¢*
Hexagon, Blank.....*5.50@5.60¢*
Square, Tapped.....*5.00@5.10¢*
Hexagon, Tapped.....*5.40@5.50¢*

Okum—
Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*3¾¢*
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5@70%*
Zinc.....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Imp'ed. Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50&10%
Stowell's Sprague.....₱ doz. 35@45¢
Vim Tin Shear and Can Opener, ₱ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....*17@22¢*

Rubber—
(Fair quality goods.)
Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with ganges—No. 1, $6.25; No. 2, $6.50 ₱ doz.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....*65&10%*

Fry—
Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Roasting and Baking—
Regal, R. M. Co., ₱ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	*40*	*50*	*60*	*140*	*150*	*160*
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

	lb.	
Asbestos:		
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	*6¢*	*1-32*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.	*8¢*	*3-32*
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.	*7¢*	*1-32*

Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll, *35@40¢*
Medium weight, 30 lbs. to roll, *40@45¢*
Heavy weight, 40 lbs. to roll..
56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢ ; 2 ply, 85¢ ; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$18.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—
1 ply (roll 500 sq. ft.), ton....
$32.50@35.50
2 ply, roll 108 sq. ft.....*55¢*
3 ply, roll 108 sq. ft.....*75¢*
Slater's Felt (roll 500 sq. ft.)..70¢

Sand and Emery—
Flint Paper and Cloth..50&10@60%
Garnet Paper and Cloth.....
Emery Paper and Cl'h..50&10@60%

Parers— Apple—
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Bonanza Improved.....each $6.50
Daisy.....₱ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
Little Star.....₱ doz. $5.00
New Lightning.....₱ doz. $7.00
Reading 72.....₱ doz. $3.25

Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—
Saratoga.....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—
List, Feb. 23, 1899.....75@75&5%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass.....50&10@60%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Carload lots.
Standard, 2-6 in..50&10@50&10&5%
Extra Heavy, 2-6 in......65&10%
Fittings.....70&10@70&10&5%

Pipe, Merchant—
Consumers, Carloads.

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
⅛ & ¼ in.	71%	55%	68%	52 %
⅜ in.	73%	59%	70%	56 %
½ in.	75%	63%	72½	60 %
¾ to 6 in.	79%	69%	76½&2%	66½%
7 to 12 in.	74%	59%	71½%	56 %

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
*Maryland, Delaware, E. Pa.*73%
West. Pa. and West Va.....75%
Virginia.....76%
Ohio, Michigan and Ky.....75%
Indiana.....77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....40&10%
Bench, Second qual.....50&10%
Molding.....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@60&10%
Molding.....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's.....60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@50&10%
Molding.....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Unica.....60%

Iron Planes—
Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Union.....60%

Plane Irons—
Wood Bench Plane Irons.....30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....℔ doz. $8.50

Plates—
Felloe.....lb. 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ℔ doz. $2.00.....50%

Pliers and Nippers—
Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers.....40%
Wm. Schollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Lodi, 50%; Paragon, 50%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable.....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—
Bulk and 1-lb. papers.....lb. 10¢
½-lb. papers.....lb. 9@10½¢
¼-lb. papers.....lb. 9¾@11¢

Pokes, Animal—
Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's.....25%

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72.....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz.....$2.00

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside.....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese.....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10-oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—
1 qt., Square.....gro. $8.00
1 qt., Round.....gro. $9.00
1½ qt., Square.....gro. $10.00
2 qt., Square.....gro. $12.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled.....40%
Tinned.....35%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%
Seal Presses—
Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears—
See *Shears.*

Pullers, Cork—
Invincible Cork Puller.....$21.00

Pullers, Nail—
Cyclops.....50%
Miller's Falls, No. 3, ℔ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, case lots, ℔ doz., No. 2, $6.00; No. 3, $5.50.
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, ℔ doz., 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	1¼	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾ 2
Screw, doz.	$0.16	.19	.23 .30
Inch	1¾	2	2¼ 2½
Side, doz.	$0.25	.40	.55 .60
Inch	1½	1¾	2 2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in......16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in..... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal.....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—
Cistern.....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—
Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—
Saddlers' or Drive, good..... *doz. 50@75¢*
Spring, single tube, good quality.....*$1.75@2.00*
Revolving (4 tubes)..... *doz. $3.50@3.75*
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Bernard.....33⅓%
Lodi, 50%; Paragon.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co...40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44.....60%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track, per ft., No. 1, 5½¢; No. 2, 7¢; No. 3.....12½¢
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾ c
O. N. T. Rail.....2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T. ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft., No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾¢
Standard.....℔ ft. 4 ¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard.....60%
Stowell's:
Cast Rail.....℔ ft. 1¾ ¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....℔ ft. 3¢
Wrought Bracket, 1⅛ x 5-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....80%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—
Disston's.....75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Boras—I C.....60%
Fox Razors, ℔ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } Discount
Red Devil.....50%
Silberstein:
Carbo Magnetic, $18.00; Griffon, No. 65, $15.00; Griffon, No. 00, $12.00; all other Razors, 40%.

Safety Razors—
Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein.....40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33½%; 2904 PN., 33½%; 0924 N., 33½%; 02084 N., 33½%; 002904 PN., 33½%; 802 N., 33½%.
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed.....70&10%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal..$1.85
Double Action, 44 caliber....$2.00
Automatic.....$3.25
Hammerless.....$3.75

Riddles, Hardware Grade
16 in......*per doz.*.$2.50@$2.75
17 in......*per doz.*.$2.75@$3.00
18 in......*per doz.*.$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... *doz. 50@55¢*
Hill's Ringers, Malleable Iron.. *doz. 70@75¢*
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—
Copper.....45@45&5%
Iron or Steel.....75@75&5%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—
Manila, 7-16 in. diam. and larger: Pure.....lb., 12½¢
Sisal, 7-16 in. diam. and larger: Pure.....lb. 9½¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed.....lb., 8¢
Pure.....lb. 9½¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed.....lb. 8¢
Pure.....lb. 9½¢
Cotton Rope: Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread No. 1, ¼-in. & up..lb. 7¢
Thread No. 2, ¼-in. & up..lb. 6½¢
Old Colony Manila Transmission Rope.....℔ lb 17½¢

Wire Rope—
Galvanized.....37½&2½%
Plain.....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 45%; Sisal.....33⅓%
Covert Saddlery Works.....60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple.....30&10%

Rules
Boxwood .....40&10&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood .....60@60&10%
Flexifold .....27½&10&10&2½%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Combination .....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 40%
Zig Zag.....40%
Zig Zag, Pin Joint.....42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band .....50&10@60
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw, 40%; Wood Saws, 40%; Hand, Compass, &c., 40%.
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts 50%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....50%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saws—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades.....25%
Keystone 40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades.....35%
Diamond Hack Saw Frames.....50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—
Barnes, No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—
Covert's Saddlery Works.....60&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. .....doz. $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz. $18.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2.....40%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon.50%

Scrapers—
Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz.$2.50@2.60
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Maine Screen Frames.....40&10&5%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, W'd, Beech.doz. 30@30&5%
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99.....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—
Standard List.....75&10@80%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50%
Swett Iron Works.....75@80%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—
Set (Iron).....80@80&5%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75%
Hex. Hd. Cap.....75%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass....85 &10@..%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
	Per doz.
Grass, No. 1, Plain....	*$6.25@6.75*
Clipper, Bronzed Webb.	*$6.50@7.00*
No. 3 Clipper, Pol'd Webb..	*$6.75@7.25*
No. 6 Clipper and Solid Steel,	*$7.00@7.50*
Bush, Weed and Bramble, No. 2	*$6.50@7.00*
Grain, No. 1.....	*$8.25@8.75*
Bronzed Webb, No. 1..	*$8.50@9.00*
Nos. 3 and 4 Clipper, Grain..	*$8.75@9.25*
Solid Steel, No. 6.....	*$9.25@9.75*

Seeders, Raisin—
Enterprise .....25@30%

Sets—Awl and Tool—
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel.....℔ doz sets $9.00

Sets, Nail—
Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ℔ gro.$12.40%
Mathew's .....℔ gro. $2.70
Snell's Cor'gated, Cup Pt....℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt.℔ gro. $7.50

Rivet—
Regular list.....75@75&10%

Saw—
Aiken's:
Genuine .....60&10%
Imitation .....50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....30%
Plate 30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.60.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal Cross Cut.....℔ doz. $8.00
Royal, Hand.....℔ doz. $4.50
Taintor Positive.....℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30.....
℔ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co.....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz.....$1.50
Mounted Kitchen Sand Stone, ℔ doz.....$1.50
Natural Grit Carving Knife Hones, ℔ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz.....$1.50
Quick Edge Pocket Knife Hones, ℔ dos.....$2.50

Skate—
Smith & Hemenway Co.....20%

Shaves, Spoke—
Iron .....doz.$1.10@1.25
Wood .....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.).....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—
Cast Iron.. 7 8 9 in.
Best ....$16.00 18.00 20.00 gro.
Good ....$13.00 15.00 17.00 gro.
Cheap .. $5.00 6.00 7.00 gro.
Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fail quality, Nickel..75@7"&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailor's Shears.....10%
Wilkinson's Sheep, 1900 list, 30&10&5%; Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—
Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—
Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00.....25%
Disston's Pruning Hook, ℔ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....50&10%
P., S. & W. Co.....33⅓%
Wilkinson's Hedge, Wilcut Brand, 60&10%
Wilkinson's Lawn and Border, Wilcut Brand.....60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction.....50%
Reading 40%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—
Reading list.....40%
R. & E. list.....33⅓%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag....$1.85
Drop, B and larger..... per 25-lb. bag, $2.10
Buck, 25-lb. bag.....$2.10
Chilled, 25-lb. bag.....$2.10
Dust, 25-lb. bag.....$2.30

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle.....$2.75@$3.00
Wood and Mall, D. Handle, $3.25@$3.50

Sieves and Sifters—
Hunter's Imitation..... gro.$9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50
Buffalo Metallic Blued, R. M. Co., ℔ gr.
14&16 16&18 18&20
$13.20 $13.50 $14.40
Shaker (Barler's Pat.) Flour Sifters, ℔ doz.. $2.00.....20%

Sieves, Seamless Metallic
—Per dozen.—
	14	16	18	20
Mesh				
Iron Wire....	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire..	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in....60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....35%
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in.....55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron.....80@80&10%
Steel .....40@40&10%

Slates, School—
Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless.60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German .....40@40&10%
Covert Mfg. Co.:
Derby, 30&2%; Yankee, 30&2%; Yankee Roller, 30&2%.
High Grade, 45%; Trojan.....45%
Jockey 35%
Covert's Saddlery Works:
Crown, 60%; German, 60%; Model, 60%; Triumph, 60%.
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—
German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—
Teas .....per gro. 45@50¢
Tables.....per gro. $0.50@$1.00

Springs—Door—
Chicago (Coil).....40&10%
Gem (Coil).....20%
Pullman (Coil).....25%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in.....℔ doz. $1.10

Carriage, Wagon, &c.—
	Per lb.
1¼ in. and Wider:	
Black	*4@4¼¢*
Half Bright.....	*4@4¼¢*
Bright	*4½@4¾¢*
Painted Seat Springs:	
1¼ x 2 x 26.....per pr.	*42¢*
1¼ x 3 x 28.....per pr.	*70¢*

Sprinklers, Lawn—
Enterprise .....25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24.....30%
Pleuger & Henger Mfg. Co.:
Cactus, 70%; Japanese, 75%; Nationals, 65%.

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } *75&10@75&10&5%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2.....50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind.....lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros.'.....30%
C. & A. Hoffmann's.....40%

Steelyards—....30@30&10%

Stocks and Dies—
Blacksmiths'.....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—
Enterprise .....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit.....60%
Gem Corundum Slips.....60%
Gem Corundum Razor Hones....50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5¼ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in.30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....60¢
33⅓&2%
India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%

Hindostan No. 1, R'g'lar, ₩ lb 8¢
Hindostan No. 1, Small, ₩ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ₩ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips 40¢
Sand Stone 6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., ₩ gro., 12 in., $10.80. $3.00
Norton Emery Scythe Stones:
Less than gross lots ₩ gro. $9.00
One gross or more ₩ gro. $7.20
Lots of 10 gross or more ₩ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₩ gro. $12.00
Lamoille S. S. ₩ gro. $11.00
White Mountain S. S. ₩ gro. $9.00
Green Mountain S. S. ₩ gro. $8.00
Extra Indian Pond S. S. ₩ gro. $7.50
No. 1 Indian Pond S. S. ₩ gro. $7.00
No. 2 Indian Pond S. S. ₩ gro. $4.50
Leader Red End S. S. ₩ gro. $4.50
Quick Cut Emery ₩ gro. $10.00
Pure Corundum ₩ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ₩ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ₩ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Cary's Universal, case lots 25&20%

Hame—

Covert's Saddlery Works 60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket doz. $1.60
Bullard, ₩ doz. $4.00
Excelsior Stretcher and Tack Hammer Combined, ₩ doz. $6.00 20%

Strops, Razor—

Star Diagonal Strop 25%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%

Sweepers, Carpet—

	₩ doz.
National Sweeper Co.:	
Louis XV, Roller Bearing, Gold Plated	$120.00
Hepplewhite, Roller Bearing, Silver Plated	$72.00
Sheraton, Roller Bearing, N'kel.	$60.00
Ye Mission, Roller Bearing, Oxidized Coppered	$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled	$36.00
National Queen, Roller Bearing, Fancy Veneers	$27.00
Loyal, Roller Bearing, Veneers, Nickeled	$25.00
Triple Medal, Roller Bearing, Nickeled	$24.00
Marion, Roller Bearing, N'kel.	$24.00
Marion Queen, Roller Bearing, Nickeled	$21.00
Monarch, Roller Bearing, N'kel.	$22.00
Monarch, Roller Bearing, Jap.	$20.00
Perpetual, Regular B'r'gs, N'kel.	$20.00
Perpetual, Regular B'r'gs, Jap.	$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled	$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned	$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled	$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled	$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire ₩ doz $25.00
Model A, Sterling ₩ doz. $25.00
Model B, Sterling, Nickeled ₩ doz. $25.00
Model B, Sterling, Japanned ₩ doz. $21.00
Model C, Sterling ₩ doz. $21.50
Model D, Sterling ₩ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks 90&10@—%
American Cut Tacks 90&10@—%
Swedes Cut Tacks 90&10@—%
Swedes Upholsterers' 90&50@—%
Gimp Tacks 90&50@—%
Lace Tacks 90&10@—%
Trimmers' Tacks 90&10@—%
Looking Glass Tacks 65@—%
Bill Posters' and Railroad Tacks, 90&50@—%
Hungarian Nails 85@—%
Finishing Nails 70&10@—%
Trunk and Clout Nails 80@—%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks 90&5 *or 6 tens*

See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. Co.	30-gal. $3.40
Emerald, R. M. Co.	60-gal. $4.25
Queen City, R. M. Co.	30-gal. $3.65
Queen City, R. M. Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin 50@—%
Patent Leather 25@30&5%
Steel 33 1-3&5%
Chesterman's 25@25&5%
Eddy Asses' Skin 40&10@50%
Eddy Patent Leather 25@30&5%
Eddy Steel 40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop 80&2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works 60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s 25%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 75@75&5%
Newhouse 45@45&5%
Hawley & Norton 65%
Victor 70&10%
Oneida Community Jump 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₩ doz. $13.25
No. 3, Rat, ₩ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₩ doz. $5.25; case of 72 ₩ gro. $4.70 doz.
No. 4, Mouse, ₩ doz. $3.65; case of 150 $3.00 doz.
No. 5, Mouse, ₩ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, ₩ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ₩ gro. $6.00
Rose Brick and Plastering 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ₩ doz. $16.00
Grocery ₩ doz. $15.00
Daisy Stove Trucks, Improved Pattern ₩ doz. $18.50
McKinney Trucks each $10.00
Model Stove Trucks ₩ doz. $18.50

Tubs, Wash—

No.	*1*	*2*	*3*
Galvanized, per doz.	*4.25*	*4.75*	*5.25*

Galvanized Wash Tubs (R. M. Co.):

No.	1	2	3	10	20	30
Per doz., net	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*.22@24¢*	
No. 12, ¼ and ½-lb. Balls	*.18@20¢*	
No. 18, ¼ and ½-lb. Balls	*.16@18¢*	
No. 24, ¼ and ½-lb. Balls	*.16@18¢*	
No. 36, ¼ and ½-lb. Balls	*.15@17¢*	

Chalk Line, Cotton ½-lb. Balls 25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. 10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality 14½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 13@14¢
American 3-Ply Hemp, 1-lb. Balls 13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 9¢
India 3-Ply Hemp, 1-lb. Balls 9¢
India 3-Ply Hemp, 1½-lb. Balls. 7½@8½¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls 9½@10½¢
Mason Line, Linen, ½-lb. Bls. 46¢
No. 26 Mattress, ¼ and ½-lb. Balls 37¢
Wool, 3 to 6 ply B 7¢; *A* 7½¢

Vises—

Solid Box 60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50. 40%
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50. 40%
Presto Quick Acting 25@25&5%
Tiger Machinists' 40%
Fisher & Norris Double Screw 15&10%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect, 20%; Lightning Grip 20%
Merrill's 20%
Millers Falls 60&10%
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%
Williamson Mfg. Co. Double Swivel 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₩ doz. $30. 25%
Perfection Saw Clamps, ₩ doz. $4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60&10%
Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Williamson Mfg. Co. Double Swivel Combination Pipe 40&5%

Wads—*Price per M.*

B. E., 11 up	*60¢*
B. E., 9 and 10	*70¢*
B. E., 8	*80¢*
B. E., 7	*80¢*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*

Dis. 15%

Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground 65%
Country Hollow Ware, per 100 lbs. $3.75
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 60%
Iron Clad Ware 70&10%
Lava, Enameled 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&5@50&10%
Never Break Spiders and Griddles 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ₩ doz.
Crescent, family size, bent frame $3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid 80&10@80&10&10%
Patent 90@90&5%
Coil:

	⅞	1	1¼	1¼ *Inch.*
	10¢	*11¢*	*12¢*	*13¢ per box*

Iron or Steel—

Size bolt	*5-16*	⅜	½	⅝	¾
Washers	*$5.60*	*4.70*	*3.50*	*3.20*	*3.00*

The above prices are based on 5.80¢ off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4 40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 60&10%

Wedges—

Oil Finish lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co. 40%
Covert's Saddlery Works 60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District $27.50@$28.00
Southern Territory $20.00@$23.00
Western and Central Districts $23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 80%
10 to 18 80&2½%
19 to 26 80&7½%
27 to 36 80&2½%
Galvanized:
6 to 9 75&5%
10 to 14 75&7½%
15 to 16 72½&10&2½%
19 to 26 75%
27 to 36 72½%
Coppered:
6 to 9 75&5%
10 to 14 75&7½%
15 to 18 72½&10&2½%
19 to 26 75&10&5%
27 to 36 75%
Tinned:
6 to 14 75&10&2½%
15 to 18 75&7½%
Annealed, Steel and Tinned, on Spools 70&10&10@70&10&10&10%
Brass and Copper on Spools 60&5@60&10&5%
Brass, list Feb. 26, '96 15%
Copper, list Feb. 26, '96 25%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24 '03 90&20@90&25%
Brass Cup Hooks and Brass Screw Hooks 85@—%

Wire Cloth and Netting—

Galvanized Wire Netting 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft. 3¼ ¢
No. 6 Mesh, sq. ft. 3½ ¢
No. 8 Mesh, sq. ft. 4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75&10&5@80%
Alligator or Crocodile 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 45@45&5%
Acme 60&10%
Alligator Pattern, 70%; Bull Dog 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Bemis Pipe 60%
Combination Black 40&5%
Merrick Pattern 50
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&2%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model 40&10&5&5%
Coes', Genuine Hammer Handle 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 50&10%
Elgin Wrenches, ₩ doz. $6.25
Elgin Rethreading Attachment, one die, ₩ doz. $4.25
Elgin Extra Dies, ₩ doz. $3.00
Elgin Extra Jaws, ₩ doz. $1.75
Elgin Monkey Wrench Pipe Jaws, ₩ doz. $2.10
Gem Pocket 50%
Hercules 70%
W & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W. 50&5%
Stillson 65%
Vulcan Chain 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₩ gross, $7.50; ₩ doz. $0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₩ doz. $48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' list net

Zinc—

Sheet per 100 lbs., $8.00@8.25

For the Table of "Current Metal Prices" see the First Issue of Every Month.

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